MacUser

JANUARY 1995 / $3.95

NEW BARGAINS

DAZZLING COLOR

WOW!

These Low-Cost Printers Will Make Your Documents *Sizzle*

PLUS

Best Ever PowerBook Battery Secrets
The Biggest Myths and Best Tips

Get It Organized!
Software That Can Actually Run Your Life

Hands-on Reviews of Hot New Programs
Adobe Photoshop 3.0, QuickMail 3.0, Now Utilities 5.0

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On the cover / The Apple Color StyleWriter 2400 prints an image from PhotoDisc's Signature Series.

Cover photo / Giampiero Benvenuti

REVIEWS & QUICK CLICKS

MacUser

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LETTERS

Good Gig

I APPRECIATED your timely article on high-capacity hard drives (October '94, page 92). As is frequently the case, you've beaten your competition to the punch.

Steve Breiter
via the Internet

YOU MENTION that drive speed is to some extent a matter of driver software. Different drives come with different software, and you test them (I presume) as they come out of the box.

However, given that many people considering the purchase of a big drive would also probably be willing to pop for formatting software to eke out more performance from the drive, you might have reformatted some drives that came with their own driver software, using a commercial utility such as FWB's HDT or Casa Blanca Works' Drive7. If we can get a relatively cheap drive and software that, when combined, are cheap, fast, and reliable, we should know about it.

Adam Rice
adamrice@crossroads.net

/ There are cases when a different driver can improve drive performance. Although we can't test every drive with different drivers, most of our reports include information on which driver comes with each drive. In some cases, two drives with the same mechanism perform differently, indicating that one driver is indeed affecting performance. / MF

Mac Duds

I DISAGREE with John C. Dvorak's conclusions in "Home Phoneys" (October '94, page 212). Personally, I don't like to shop with lots of other people. I don't like having to wait in line and wade through crowds. It is not just duds who will use interactive services.

But an even more important issue is going on here. Competition with electronic services will force businesses to lower prices and/or improve services. This is already happening where I live. The smart businesses know that the people using these services aren't just duds. The future will show just which one of us is the dud.

Christopher M. Thomas
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JOHN C. DVORAK'S COLUMN was right on target. The cable/phone/game providers that are rushing to give it all to us while we vegetate on our couches just aren't in tune with society. The booming sales of athletic shoes; fitness-club memberships; and low-fat, fiber-rich foods show that this is still the age of physical fitness, not lounge-chair lizards. Have these people actually polled the public to see what we desire, or are they just going to introduce their products and *then* try to create demand? If the latter, their investors may be in for a rude shock when the products are ignored by an uninterested public.

Kurt Tappe
kurt.tappe@bentley.com

I COULD NOT AGREE MORE with John C. Dvorak's assessment of today's social situation. With all the interactive 3-D-rendered CD-ROM games, and the Internet especially, people are more inclined to sit at a computer than do sociable things. We are all dreaming about the "information superhighway" so we can indulge in all sorts of conveniences. We all need to get out and enjoy ourselves. Life is too short.

Ben Weiner
bweiner@shadowso.com

OPEN FOLDER

The cult of personality has invaded our pages this month, thanks to several missives received via the Internet. Slow processing of Adobe Photoshop filters has given reader David Blum ample time to make some strange observations. David notes that Maggie Canon bears a striking resemblance to that doyenne of baking, Betty Crocker, who was actually a composite crafted by a crack team of marketeers. "The thought that Maggie does not actually exist frightens me," he writes. David, you've obviously been spending too much time manipulating reality in Photoshop. Maggie's for real. And, hey, get a Power Mac.

As long as we're allowing a peek into the inner sanctum, we'll answer this question from Vincent M. DelGuercio: "What kind of Macs, if any, do the people at *MacUser* use?" As much as we'd like to tell you we use Osborne, Kaypro, and Timex-Sinclair computers to prepare copy that is then set by hand, using a hot-metal Linotype machine, we'll fess up: We do in fact use Macs of all shapes, sizes, and speeds. We're always pushing the envelope too. Technical director Henry Bortman takes great pride in the fact that he's running System 9 on his original 128K Mac.

Recycling those old Macs inspires great creativity. Andy Ihnatko makes aquariums out of old Pluses, SEs, and Classics, but that solution doesn't suggest what to do with ancient peripherals. "Now what should I do with my dead mouse?" writes Allan Crain. Well, if you can round up enough of them and hang them from a nearby tree limb, you can have high-tech wind chimes.

Ingenious crafts may have made Andy a minor cult figure, but he can't compete with his boss. "The first thing I see when I open the magazine is Maggie Canon, who's certainly easier on the eyes than Ihnatko," writes George Mealor. So much for Andy's hopes of getting a recurring role as the pool guy on *Melrose Place*.

ASK DR. POWER MAC

IF I BUY A POWER MAC with a PowerPC 601 processor, will I be able to upgrade to the PowerPC 603, 604, or 615 chip?
John Pratt
via the Internet

/ Apple has not said publicly whether there will be 604 upgrades for current machines. To set the record straight, the PowerPC 603 is used primarily in low-power or portable systems and is not as fast as the 601. The 604 is the next generation of the PowerPC; it will offer as much as twice the performance of the 601. The 615 is supposed to be able to run RISC and x86 software, but the chip's only a rumor right now; on the other hand, the PowerPC 620 processor, which should run three times as fast as the 601, has been announced. Just don't count on seeing either of these new processors in a Mac any time soon.

I'M THINKING OF ADDING RAM to my LC 575. I'd also like to acquire the PowerPC upgrade card that Apple has announced for the LC 575. If I add more RAM now, will I still be able to use these chips with the PowerPC upgrade?
Jerry Martin
grmartin@stthomas.edu

/ Your RAM investment should be safe. The Macintosh Processor Upgrade Card — which works in the LC 475, 575, and 630; the Performa 470, 570, and 630 series; and the Quadra 605 and 630 — fits into the socket used by the 68040 and uses RAM on the motherboard. But since most applications running on a Power Mac require more RAM than they do running on a 680x0 Mac, you should probably buy extra RAM when you get the upgrade.

YOUR REVIEW of the Quadra 630 ("Versatile Values," September '94, page 70) says that "you can even turn it into . . . a Power Mac that runs native PowerPC applications as well as 68040 applications without emulation." That's good news to me, because I'm seriously considering getting a Quadra 630. However, elsewhere I've read that the Power Macintosh Upgrade Card works with any Centris or Quadra model except the 605, the 630, and the AV models. What's the truth?
John Fieser
via the Internet

/ You're confusing two different upgrades, thanks to Apple's obtuse naming conventions — the Power Macintosh Upgrade Card you refer to is the one meant for older models and goes in a slot, whereas the Macintosh Processor Upgrade Card (see above) replaces the 68040 chip in that Mac's processor socket. (The 68040 is relocated to the upgrade card itself.)

Share and Share Alike

I'M JUST LEARNING to get around on the computer-connected phone lines of the world and have been fascinated by all the information I hear is available if I get connected to the Internet. I was pleased to read that there is a free Internet guide for people such as me, "Big Dummy's Guide to the Internet" ("The 1994 *MacUser* Shareware Awards," October '94, page 133). How do I get a copy of this information? On the Internet, of course! I don't know how to get connected to the Internet to get the information to get me connected to the Internet to get the information . . .
Harold Shepperd
Portland, OR

/ The Electronic Frontier Foundation says that "Big Dummy's Guide to the Internet" will be published soon by MIT Press as *Everybody's Guide to the Internet*. A copy of the guide on floppy disk is also available from the EFF (202-347-5400). / JS

I READ ABOUT your 1994 shareware awards with interest and wanted to download GMS Calendar from ZiffNet/Mac's Download & Support Forum. But the file isn't there. Where is it? I'd love to try it out.
Jerry Douglas
DocJer@aol.com

/ It turns out that our shareware-awards judgment was right on — GMS Calendar turned out to be so good that Apple has picked up the distribution rights and is bundling it with the new 500-series PowerBooks. As a result, the program is no longer available for shareware distribution. / JS

Stochastic Remarks

YOUR ARTICLE ON stochastic screening ("Screening Schemes," October '94, page 109) gives the impression that stochastic-screening technology is available only from hardware vendors. You make no mention that such screening can be accomplished in software. Our LaserSeps Pro is an Adobe Photoshop filter that prepares images for final output, using stochastic-screening technology. The processed images can then be included in a layout and output to any imagesetter.
Donald D. Toy, Director of Marketing
Second Glance Software, Laguna Hills, CA
info@secondglance.com

/ Thanks for the info. As we explained in the "Highfalutin Dithering" sidebar to that story, it is possible to achieve the effect of stochastic screening

in Photoshop (without additional filters), but because of the intense calculations required, sophisticated stochastic-screening algorithms generally need the processing power of dedicated raster-image processors. / PP

The Odd Coupler

YOU GIVE SHORT SHRIFT to using an acoustic coupler to connect a modem to a phone line, calling it a "last-choice solution" ("Phone-Savvy Traveling," October '94, page 137). But there's a lot to be said for carrying a lightweight acoustic coupler instead of an armload of adapters, tools, and telecom manuals.

Modern couplers are a far cry from the 300-bps couplers of yesteryear. They are lightweight, battery-powered, fast, and reliable and are the only universal solution to connecting. I have been able to routinely connect at 9,600 bps or more from pay phones, cellular phones, cordless phones, and international phones with my acoustic coupler, without having to become an expert on phone systems.

Brent Cochran
via the Internet

Not on My Street!

YOU GAVE Street Atlas USA a four-mouse rating ("The 50 Best CD-ROMs," October '94, page 73) but didn't mention some major problems.

You state, "You can create custom maps easily — simply choose which streets and landmarks you want to include." But version 2.0 does not provide the ability to suppress any features displayed at any level of magnification. What you see is what you get, like it or not.

The program has a tool that supposedly allows you to label streets. Click on the street, and the name and the block number appear to the right. It doesn't work on all streets and roads, though. And there's an erase tool — but it is not a tool. It is a switch that erases everything that is not part of the basic display. If you've labeled several streets, made a mistake, and wish to unlabel one, you must erase *all* the labels and start over.

Street Atlas is a useful product, but it doesn't warrant a four-mouse rating.

Dick Tripp
dtripp@cclink.logicon.com

/ If you click correctly on a street, its name does

come up, but sometimes getting it just right can be difficult. And yes, the erase tool's limitations are annoying. But being able to get a street map of any place in the U.S. — even tiny places that don't appear on regional maps — makes the program still worthwhile. / CB

Handwriting Analysis

PLEASE TELL Joe Clark not to toss out his keyboard. The fact is that the MacHandwriter (Reviews, August '94, page 43) is a complement to the keyboard, *not* a replacement for it. We would never claim that the MacHandwriter reads cursive writing. It doesn't. We do claim a very high recognition rate for printed words and letters, although we realize that recognition varies from person to person.

The MacHandwriter is designed to replace the mouse. It is a gangbuster editing tool, great for working with spreadsheets and terrific as a graphics device — since it's easier to draw with a pen than with a mouse.

You also made some inaccurate technical comments. Multiple monitors *can* be used with the MacHandwriter. Your statement that "you have to use a keyboard for commands that require use of the Shift, Option, and/or Control keys" is also incorrect.

Dennis D. Maxwell
Vice President, Corporate Development
Communication Intelligence
Redwood Shores, CA

A Success Story

YOUR ITEM "PowerBook Secrets / When You Blow a Fuse" (September '94, page 149) could not have come at a better time.

Just after an electrical storm, I noticed that my PowerBook 145 would not run off the battery, just as described. Because of this item, I was able to identify, remove, and replace the blown fuse. For about $1, I now have a fully operational PowerBook. Please keep up the good work with this type of information!

Nick Stokes
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Bo Knows Printers?

PERHAPS I MISREAD the criteria for your office-printer report ("Powerful Printing Partners," September '94, page 98). It seems to me that you missed a viable contender in the Xanté Accel-a-Writer 8100. It comes stock with 12 MB of RAM; prints at

600 dpi (upgradable to 960 dpi), including full bleeds, on paper as large as 11 x 17 inches; and has autoswitching LocalTalk, parallel, and serial ports. The Accel-a-Writer has a PostScript Level 2 interpreter, a RISC processor, and a SCSI port and supports dual paper trays. The price for the basic model is only $3,995.

Frankly, I don't see how you could have overlooked this printer, and I hope that people in the market for this level of printer will actively seek out Xanté's as a viable product.

Chandler Briggs
via eWorld

/ Thanks for the input! Unfortunately, Xanté discontinued the Accel-a-Writer 8100 in August, and the company was not shipping its replacement, the Accel-a-Writer 8200, in time for it to be included in our report. / CE

Gone Fishin'

I GIVE DOUBLE THUMBS-UP to Maggie Canon's great column ("Unplugged," October '94, page 17) on vacationing sans Mac. And I thought *I* was the only one who faced the dilemma of whether or not to take my trusty PowerBook along on my annual retreat to the outback!

During a business trip to Scotland, I faced three days of Mac-lessness as my hard drive took a dive. I found it a great break *not* to be able to read e-mail, finish that report, or work on the next newsletter. Instead, I was able to unwind, watch a few *awesome* sunsets, and even get in some special time with the ones I really care about. Besides, aren't Macs here to make our lives simpler?

David Wegener
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CORRECTIONS

The list price for Tree Professional (Quick Clicks, October '94, page 63) should have been $695.

After we went to press with the October '94 issue, Sony shelved plans for a Mac model of its CD-ROM Discman (New on the Menu, page 30).

The PowerBook features table in the August '94 issue (page 88) inaccurately reported that the PowerBook 145B has video-out capability.

"Power Imaging for Power Publishers" (November '94, page 72) incorrectly listed Silicon Graphics' toll-free number. The correct number is 800-800-7441.

New Year's Predictions

YOU CAN DIAL A PSYCHIC HOT line for predictions on the coming year's news, or you can find them

in this issue of *MacUser*. If you are reading this, congratulations on a wise choice. If you're itching to find out the latest on Charles and Di or Lyle and Julia, well . . . operators are standing by. But in the ever engrossing digital world, here are my predictions for the new year:

1995 will be **The Year of the Clone** for Apple. The company is finally biting the bullet, and by the time you read this, it will have inked a deal with IBM and Motorola to develop and manufacture a Power Macintosh clone for the U.S. big-business market, which has forever been the code Apple can't seem to crack. Apple will sign similar agreements with several international companies, finding a back door into less penetrable markets overseas via regionally favored clone vendors. The upshot of all this activity will be more Mac-everything: more Macs (in 31 flavors!), more third-party products, more advertising, more price wars. It's mostly good news, although we'll see how we do with reliability when they send in the clones; Apple Macintosh will continue to be the Real Thing, and you can expect Apple to amplify this message.

1995 will be **The Year of Compatibility.** Sing hallelujah! Apple's truly got religion in a big cross-platform way, and this is another offering at the altar of big-business accounts. Apple will introduce new 486 hardware-compatibility boards and a new, faster version of SoftWindows will be winging its way to market soon. If you've been struggling to get the Macintosh onto your corporation's purchasing list or keep it there, Apple's cross-platform story and the existence of second-source clones from IBM and other vendors should put Macs back on the list as a viable, rather than a career-limiting, option.

1995 will be **The Year That Makes or Breaks OpenDoc.** Although I'm intrigued by the notion of component software (as opposed to today's humongous, does-every-thing-except-floss-your-teeth apps), I wonder if OpenDoc will really become the industry mantra Apple intends it to be. Consider Microsoft's arm-twisting licensing practices that require applications to do the OLE thing before donning the Windows logo, for one thing. And I'm not sure I understand what the business model is for developers that create OpenDoc tools. Developers readily agree that OpenDoc is a superior technology — but will the revenues pay the rent?

1995 will be **The Year That Holds Microsoft and Intel's Feet to the Flame.** (And in case you were wondering, they're size-22 Nikes). True, Microsoft has just sucked up Intuit — one of the company's few successful foes — as if it were a plate of oysters on the half shell. But the cost and labor intensity of the Windows-3.1-to-Windows-95 transition will cause some wailing and gnashing of teeth. Expect Microsoft's customer base to divide into two camps: loyal 3.1 users and Win 95 users who've ponied up big for Bill.

1995 will be **The Year of the PowerPC PowerBooks.** Apple will simplify the PowerBook line, focusing on three primary

> *1995 will be The Year of the Clone. Apple's finally biting the bullet, and by the time you read this, it will have inked a deal with IBM and Motorola.*

areas: affordability, light weight, and high performance. Rumors of the Duo's death will prove to have been exaggerated: Duos will be alive and well and packing PowerPC chips in their slender frames. Look to see color and wireless communications take center stage this year.

1995 will be **The Year of 3-D.** As developers take advantage of the Power Macs' capabilities, 3-D will enter the mainstream and the tools will become easier to use — and you know what that means: Friendly little cubes and spheres will work their way into routine office memos like the riot of fonts that characterized the early DTP days. 3-D may secure for Apple some of the limelight Silicon Graphics has enjoyed in the areas of modeling and rendering and give the company a wonky kind of Hollywood cachet. Rent *Jurassic Park* if you're unclear on that last bit. Desktop publishing, multimedia apps, and business-productivity apps will all begin to incorporate 3-D in the year ahead.

1995 will be **The Year of Living Dangerously.** Windows 95 will storm the market with a hurricane-force marketing program. Developers will continue to merge and purge, and licensing and partnership deals will continue to be negotiated, keeping the high-tech community on perpetual standby for the next big thing. But through the thickets of uncertainty that grow in every corner of the coming year, there's one area of clarity I'll put my money on: 1995 will be the year that Apple CEO Michael Spindler finally gets some respect.

Plaque Buildup

IT'S TIME TO HAND OUT A FEW

awards, sensation-seekers. Yes, after years of being nominated for various things and having nothing to show for it except a shelfful of creamers and tableware stolen from some of our nation's better hotel banquet rooms, I've decided to channel that rage and tip my cap at those achievements of this past year that, in my modest opinion, merit my hurling a hunk of chrome and wood in their progenitors' direction.

Oh, I have nothing against our own Eddy Awards. Well, granted, I've always wondered why our chosen symbol for excellence is a statue of someone heaving a Mac as far away as he can, like Larry Bird trying to land a three-pointer in the closing seconds of a playoff game. Hardly symbolic of the high level of user satisfaction of which Apple is so justly proud. But that's a minor point. No, I'm creating my own awards — awards I refuse to dignify with a name — solely because I unfortunately do not wield sledgehammerlike totalitarian control over the Eddies. I'm sure you can understand my point of view here: It just saves me from a lot of tiresome bickering with those who have the temerity to defy my will.

Our (by which, of course, I mean *my*) first award goes to Berkeley Systems, for picking up the banner so carelessly tossed aside by the giants of our industry long ago. I mean, the mid-'80s — *that* was a golden age of litigation. Every day you'd get to see hordes of attorneys battling it out with all the pageantry of a World Wrestling Federation cage match. But lately, Hewlett-Packard, IBM, Microsoft, and Apple can hardly seem to motivate themselves to even try to beat a speeding ticket. So Berkeley Systems' spunky enthusiasm in the legal ring is downright exhilarating. With a giddy lack of mercy and to the appreciative cheers of delighted fans of corporate litigation everywhere, Berkeley Systems has sued the pants off Opus 'n Bill for shotgunning flying toasters and defended its toasters' trademark against the claims of aging down-on-their-luck rockers. The new "Flying Toasters Anthem" has a good beat too, and you can dance to it.

Next, a tip of the fedora to Aladdin Systems, for its spectacular freeware and shareware offerings, StuffIt Expander and DropStuff with Expander Enhancer, respectively. Distributing a free archive-expanding utility is just business as usual for companies marketing a commercial archiving product, but Aladdin takes the cake for aggressively creating utilities of genuine commercial quality and then trusting folks to pay for them only if they think they're worth a modest fee. These two packages' robustness and their close attention to users' current needs — such as trivially easy one-step (or *zero*-step) decoding and expansion of files from Internet sources — demonstrate exactly how vastly this firm doesn't suck. Download these utilities, and I guarantee that you'll be sending these people homemade brownies within a week of installation.

Apple receives no fewer than three awards this year, starting with the PowerBook 540c. Much has been said of its features, power, and expandability, but I would rather honor Apple for a larger reason: At long last, we Mac devotees of limited income have just as good a chance of owning the top-of-the-line PowerBook as our trust-fund brethren. Whereas you once had to sheepishly admit that you *wanted* a 180c but couldn't possibly afford one, now you can boldly and bitterly announce to your coworkers that if the 540c you've had back-ordered for five months doesn't show up soon, you're going to chuck it all and just buy a reconditioned PowerBook 100. Once again, Apple reaffirms its commitment to the proletariat.

In the Newton category, I'm singling out Eidetic's Notion list manager. No other application so effectively sums up the overall *rightness* of the Newton. You demonstrate it to people, and they instantly understand the power of carrying around a tiny little machine that stores *all* the information you need at your fingertips, with none of the baggage of a notebook computer. In the same way as many sales of 128K Macs were based on demos of MacWrite and MacPaint, Notion helps sell MessagePads.

With all the Microsoft-bashing you hear these days, I'm delighted to honor Word 6.0. I mean, the air has always been thick with rumors of Microsoft not caring about the Mac market or even of its taking active steps to kill it off. Rubbish. With Word 6.0, Microsoft has proved itself to be *the* key booster of cutting-edge Mac technologies by having the Mac's most popular word-processing application require a 100-MHz PowerPC processor for optimum performance. I understand that the president of Motorola had a lovely assortment of exotic cheeses sent to Microsoft Galactic HQ shortly after Word 6.0 shipped.

Next, kudos to Apple for eWorld. It's

PROBLEM:

Although frequently nominated, Andy never wins any awards.

SOLUTION:

'Tis better to give than to receive.

taken eight years, but now there's a graphical on-line service that both looks *and* feels good. But the best thing about eWorld is its refreshing change of pace. Most services are bustling, noisy, crowded places, but eWorld is like a peaceful night in the forest. You can log on and then kick back in your chair with a good book and enjoy the solitude, knowing there won't be another soul to bother you for miles around.

Speaking of health, let's applaud Keep It Simple Systems' SunRunner line of solar panels. It's not the first such product for the PowerBook but certainly the first I've seen that is lightweight and durable enough to consider taking outside. And think of the health benefits. "Hang on," propellerheads will interrupt, as you explain the product. "You're saying that I'll be able to use my PowerBook 540 as long as I want, without a recharge?" And out they'll go, giving their skin the first prolonged break from fluorescent lighting it's had in nine years.

Of course, I kid Apple a lot, but the fact remains that every time I turn around, it's adding *something* so terribly cool to the

Mac operating system that I stay up an hour later every night playing with my Mac. With System 7.5's scriptable Finder, Apple has dumped another huge wheelbarrow of power into the laps of The Huddled Masses. Now Mac users with a modest knowledge of AppleScript have the ability to create their *own* solutions to their daily computing needs, from the mundane to what would have previously been absurdly complex.

My final award goes to the World Wide Web. I'm being quite sincere when I say that the Web is exactly the sort of thing you point to when people ask whether computers are having a good influence on society. Using a simple page-markup script, almost anyone with real Internet access can publish their own information on the Net and present it in a highly graphical and interactive way. It also encourages the free exchange of resources in a way I never thought I'd live to see and puts a friendly face on Internet services. Think of it. Write movie reviews for fun, and just your friends and family can enjoy them. Create a Web page with them, and millions can. Create links to preexisting

Internet databases of films, directors, and actors; links to another person's Web page of movies on video; and links to public sites full of scripts, movie clips, and sound files — and you've created a killer graphical service all about your favorite hobby that could arguably compete with the commercial services but that folks can access for free. And word starts to spread, and people start putting links to your page into *their* pages, and so it goes. Thousands of people are doing this every single day. All the minds and interests you can plug in to — it's literally a dizzyingly fine prospect. I can only hope that the Web becomes strong enough that the increasingly rabid corporate interests can't wreck it for everyone.

So congratulations to this year's many winners; you should be receiving your award statuettes shortly. Eventually. OK, there aren't any statuettes. But by all means, feel free to bolt something onto a hardwood base and stick it on a shelf somewhere, and if you swing by my office with it, I'll be only too pleased to allow your PR flunkies to photograph me forking it over to you.

MICHAEL SWAINE

Agents of Change

THIS YEAR, APPLE IS SUPPOSED to release the most significant upgrade to its operating system since 1991. A key element of this release is a technology Apple calls agents. But are Apple's agents really agents?

Software agents are the focus of a lot of cutting-edge research in computer science these days, and there's a fair consensus on what an agent is. An agent is a program that can carry out tasks for users, things such as finding data remotely, interpreting and responding to messages, and filtering data for content. An agent, as its name implies, represents you and your interests to some system (or to other people), which (or who) may also have agents representing them.

What would it be like to have such software agents representing us?

Imagine that when you dial a long-distance telephone number, a software agent in your telephone broadcasts a request for bids. Immediately, software agents for AT&T, MCI, and Sprint place bids based on currently available lines. Your agent awards the call to the lowest-bidding company, and the whole operation takes place in an imperceptibly brief time. Not only do you get the lowest possible rate all the time but also billion-dollar companies are bidding for your business as if you were the federal government. It would be like that.

To pull this off, these agents would have to be savvy negotiators. For example, you might think that your telephone agent should pay the lowest-bidding company the low-bid price, but researchers say no, the best strategy for minimizing cost turns out to be to contract to pay the lowest-bidding company the *second-lowest*-bid price. This game-theoretic strategy ensures that bidders have no inducement to pad their bids. Agent research is filled with this sort of strategic analysis, more commonly found in business and political-science research than in computer science.

Now imagine all transactions everywhere being mediated by software agents. Every book, speech, painting, video, song, or poem available electronically includes a chunk of code capable of negotiating publication and reuse rights. Your meetings get scheduled painlessly by the agent on your PDA, negotiating over an infrared link to a network with agents on other PDAs and computers in and out of the office. Network resources are allocated fairly through negotiations among agents representing the contending users and the resources themselves.

Or imagine a computer operating system designed as a collection of interacting agents.

Well, now we've gone too far. That's not what Apple has in mind for this year, or anytime soon, as far as I can tell.

Here's what Apple seems to mean by the word *agent* today, this year, and beyond:

Today: *Agent* means task-oriented, canned scripts for synchronizing folders, alerting you when a particular folder's contents change, and turning file sharing on or off, for example.

This year: *Agent* means the ability to create such scripts yourself without any programming.

Beyond: *Agent* means scripts that have the ability to write themselves, based on observations of your everyday work habits.

In other words, AppleScript scripts and easier AppleScript scripts. Apple calls them agents. They are not.

It doesn't even seem likely that a technology based on AppleScript scripts is ever likely to evolve into true agents. Successful negotiation requires a common language, and it's unrealistic to think that agents on Windows and UNIX systems are going to talk AppleScript.

It'd also be nice if Apple and computer-science researchers who are working on agent technology would talk a common language, so they would not use *agent* to mean two completely different things. But I suppose that's unrealistic too.

Well, does it matter? It does, because Apple should be working on true agent technology. This stuff is not just blue-sky artificial-intelligence research that might possibly turn into something someday. Pieces of it exist right now, in General Magic's TeleScript, for example.

And there's this: The fastest-growing software market today is the information superhighway or, rather, the closest thing to it in existence, the Internet. That is, if someone can figure out how to turn the remarkable explosion in the number of people using the Internet into an actual market for software. A growing contingent in the computer-science community thinks agents are the key to doing this.

If they are right, Apple would be really dumb not to be working on true agent technology. And I don't think Apple is dumb.

> *Imagine that when you dial a long-distance telephone number, a software agent in your telephone broadcasts a request for bids.*

NEW CPUS /

POWER MAC 8100 HITS TOP SPEED

New PowerPC chip makes this Mac the fastest yet.

HIGH PERFORMANCE is the name of the game with Apple's latest Power Macintosh — the 8100/110. Although it looks like its lower-powered sibling, the 80-MHz 8100, the new model sports a 110-MHz 601+ processor, making it the fastest Mac yet.

The 8100/110 comes in one configuration only: 16 MB of RAM (expandable to 264 MB), a whopping 2-GB internal hard drive, a CD-ROM drive, and Apple's VRAM video card (2 MB of VRAM) — no AV option is available. Like the 8100/80, it comes with a standard 256K Level 2 cache for improving system speed across applications. Also, it has System 7.5 preinstalled. That's just as well, since previous versions of system software, such as System 7.1.2, which ships with the earlier Power Mac models, don't run on this machine.

Under the hood are several enhancements that help this Power Mac run at 110 MHz. Between the PowerPC processor and the heat sink, Apple installs a Peltier cooling device, which efficiently transfers heat away from the processor by creating a small charge between two metallic plates. Because it is relatively cool, the 601+ is able to run at its optimum speed. Apple is the first company to use a Peltier device in a personal computer.

Apple has also improved the NuBus controller chip to support burst-mode transfers between cards and to allow for a NuBus expansion chassis. The burst-mode support for NuBus cards should allow SCSI and video-capture cards to provide better performance on the 8100/110 than on earlier Power Macs. A NuBus expansion chassis, such as one sold by Second Wave, lets you install multiple cards in an external box.

Although we didn't have a chance to test the NuBus improvements on the 8100/110, we did run a series of speed tests, including Ziff-Davis' MacBench 1.1 and a host of business- and graphics-application benchmark tests. Overall, the 8100/110 was about 30 percent faster than the 8100/80. Compared to our baseline machine, the Quadra 840AV, the 8100/110 was about four times as fast. Speed improvements over the 8100/80 were incremental.

Is it worth it? All this power comes at a premium price. Apple expects the 8100/110 to cost $6,379. That's about $2,100 more than the entry-level 8100/80 and $1,000 more than the top-of-the-line 8100/80, which comes with a 1-GB hard drive. 800-776-2333 or 408-996-1010. / Sean J. Safreed

Application-based tests

MacUser ZD LABS **BETA!**

Adobe Photoshop 2.5.1
The 8100/110 applied Gaussian Blur and Unsharp Mask filters three times as fast as the Quadra 840AV.

Aldus FreeHand 4.0
Rotating a graphic in this illustration program was nearly five times as fast on the 8100/110 as it was on the Quadra 840AV.

Aldus PageMaker 5.0
Changing a long document's point size took less than half the time on the 8100/110 than it did on the Quadra 840AV.

Microsoft Excel 5.0
The 8100/110 was nearly two and a half times as fast when running our Excel macro as compared to the Quadra 840AV.

Specular's Infini-D 2.6
Rendering an animation on the 8100/110 was more than four times as fast as on the Quadra 840AV.

	Photoshop (SLOWER)	FreeHand (SLOWER)	PageMaker (SLOWER)	Excel (SLOWER)	Infini-D (SLOWER)
Power Mac 8100/110	13.1	30.6	31.2	26.2	114.2
Power Mac 8100/80	17.4	36.8	42.6	31.4	151.5
Quadra 840AV	44.0	144.6	70.0	63.8	447.7
	TIME IN SECONDS (0 25 50)	TIME IN SECONDS (0 75 150)	TIME IN SECONDS (0 35 70)	TIME IN SECONDS (0 35 70)	TIME IN SECONDS (0 225 450)

MacBench 1.1 tests

	Video Mix (FASTER)	Processor (FASTER)	Disk Mix (FASTER)
Power Mac 8100/110	278.7	36.8	30.5
Power Mac 8100/80	229.7	35.7	28.4
Quadra 840AV	47.9	22.2	23.7
	PROCESSOR INDEX (0 150 300)	VIDEO MIX INDEX (0 20 40)	DISK MIX INDEX (0 15 30)

These benchmark tests use the LC III as the reference platform, assigning it a score of 10 for each test. They show the relative speed of the hard-drive and video-display subsystems and the processor of the platforms tested.

TECHNOLOGY TRENDS /
ADOBE COMMITS TO OPENDOC
Key applications to serve as OpenDoc parts.

IN ITS PITCHED BATTLE against Microsoft's OLE (Object Linking and Embedding) technology for industrywide support, the OpenDoc standard is steadily gaining ground. Now CI Labs, the nonprofit organization formed by Apple, IBM, and Novell to develop the standard, has found a key partner: Adobe Systems has committed to providing applications that support the OpenDoc standard.

Like OLE, OpenDoc provides a framework that allows applications to work together seamlessly, even across platforms. OpenDoc applications can be *parts* or *containers.* Parts are small applications that add features or functionality to core applications called containers. Adobe plans to make part applications that work as companions to the current versions of Photoshop, Illustrator, and Premiere.

For example, Adobe's part for Photoshop will let you display and print Photoshop files in a container. With the Photoshop part, it may also be possible to run some Photoshop filters on an image directly from within the container. To select and edit it, though, you'll need to open Photoshop. Adobe declined to state when its parts will be available or whether currently available programs will become container applications.

As Adobe joins WordPerfect as a key provider of OpenDoc applications, other software developers have also expressed interest. Claris is working on extensions to OpenDoc that may benefit all OpenDoc developers. At a recent briefing, Claris demonstrated how interface enhancements and new tools can be added to a container application via drag-and-drop. For instance, a user might give a draw container an on-the-fly face-lift with a new interface or specialty tools by dragging an extension onto the container software. Third-party developers can easily provide specialty tools for vertical markets without the massive overhead of creating monolithic applications. Users get the benefit of flexible software that can be custom-tailored for individual needs.

That's all well and good, but you need OpenDoc software to run OpenDoc applications. When will OpenDoc itself be ready? Apple expects to be beta-testing OpenDoc for the Mac by the time you read this and hopes to ship the software in the first quarter of 1995. / Sean J. Safreed

PRINTERS /
It Fits in the Palm of Your Hand

TO BE TRULY PORTABLE, a printer should be compact, lightweight, and cordless — like the new $429 Citizen PN60 for Macintosh. About the size of a flashlight, this 360-dpi printer weighs just 1 pound (1.5 pounds with its rechargeable battery loaded). It ships with an international power supply, and on-the-go types will also like its optional car adapter ($49).

The PN60 uses a friction-feed mechanism to move paper past its thermal print head. The printer's engine is rated to print 2 pages per minute, but since you load paper manually, your mileage may vary. A fully charged battery can print 50 pages. Expect to get as many as 30 pages of text from a single monochrome ink ribbon ($8.99 for two) and as many as 5 transparencies from a single color ribbon ($13.99 for two).

The PN60 connects to PowerBooks and Newton MessagePads through its RS-422 serial port. It ships with five fonts and can emulate Apple StyleWriter printers. 310-453-0614. / Pamela Pfiffner

CD-ROM /
Taking Up Residents

NOT WEIRD ENOUGH FOR YOU? Hot on the heels of their critically acclaimed CD-ROM Freak Show is The Residents' most recent foray into the bizarre, Gingerbread Man. In this interactive album by the oddball rock band, the mystical Gingerbread Man maneuvers into the thoughts of some pretty strange characters and uncovers their eccentric personalities through each one's "brain song." Sure to please fans of the group are nine original songs and more than 35 minutes of new music. Developed by ION and distributed by Navarre. $49.95. 800-728-4000 or 612-535-8333. / Kristin Balleisen
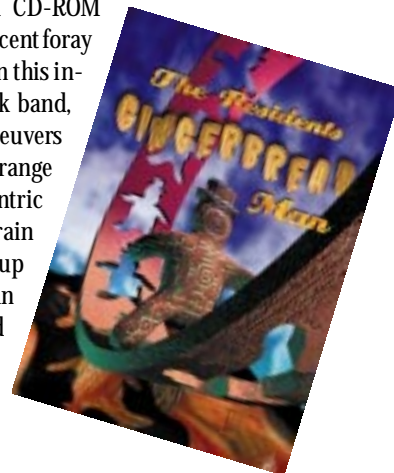
POWER MAC UPDATE

HOUDINI WORKS NEW MAGIC
Apple card brings DOS to Power Mac 6100.

A DISAPPEARING ACT is great if you're watching a magician, but the disappearance of Apple's DOS-compatible Quadra 610 — formerly code-named Houdini — left people scratching their heads. But in January, the DOS Compatibility Card is reappearing as a card for the Power Mac 6100, with cards for other Mac models to follow in the first half of 1995.

The new DOS Compatibility Card, which comes stand-alone or as part of the Power Mac 6100 DOS Compatible system (a Power Mac 6100 with 16 MB of RAM and a 350-MB hard drive), sports several improvements hinted at in early technology demos, including networking and support for Creative Solutions' SoundBlaster. The original DOS card used an anemic 25-MHz 486SX processor, but the new card uses Intel's 66-MHz 486DX2. A daughtercard provides 16-bit SoundBlaster support through the Mac's standard sound-out port, making the DOS Compatibility Card compliant with the MPC I standard. Bundled software provides the necessary ODI drivers for NetWare and TCP/IP Ethernet connectivity, important in the corporate world. Like its predecessor, the new PDS card can share the Mac's RAM to run DOS and Windows applications, but now you can also add as much as 32 MB of RAM in a single 72-pin SIMM slot.

Other PDS cards should be available, from Reply, in early 1995. Apple has licensed the technology for future DOS cards to Reply, so you can expect the same features in a version for Quadras with PDS slots, particularly the 650, 700, 800, 900, and 950.
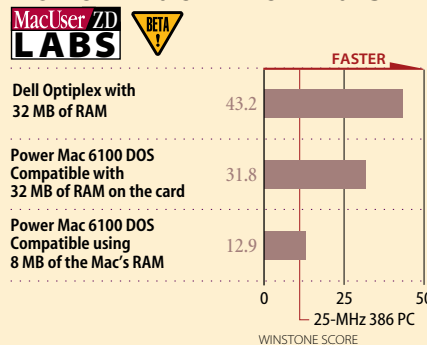
We tested the DOS Compatibility Card by using the Ziff-Davis Winstone '94 benchmark tests for Windows machines. Winstone runs a series of application tests, using 12 popular Windows applications, and returns a weighted score based on a baseline score of 10 for a 386 PC running at 25 MHz.

All testing was in VGA mode. The Power Mac 6100 DOS Compatible with 32 MB of RAM on the card was more than three times as fast in VGA mode as the baseline system. However, when the card was configured to share 8 MB of the Power Mac's RAM, it was barely faster than the baseline system. Compared to a Dell Optiplex with a 486 DX2, local-bus video, and a fast IDE drive, the Power Mac 6100 DOS Compatible in the 32-MB configuration was 26 percent slower.

The Power Mac 6100 DOS Compatible system sells for $2,999. The user-installable card is available for $699. / Sean J. Safreed

Power Mac Time Trials

MacUser ZD LABS BETA!

	WINSTONE SCORE	FASTER
Dell Optiplex with 32 MB of RAM	43.2	
Power Mac 6100 DOS Compatible with 32 MB of RAM on the card	31.8	
Power Mac 6100 DOS Compatible using 8 MB of the Mac's RAM	12.9	

0   25   50
25-MHz 386 PC
WINSTONE SCORE

Power Macintosh Revealed

THIRSTY FOR Power Mac knowledge? *MacUser* contributing editor Stephan "Obi-Wan" Somogyi has all the answers to your Power Mac questions in *The PowerPC Macintosh Book,* from Addison-Wesley (1994). It explains the intricacies of Power Mac hardware and software in language anyone can understand. $19.95. 617-944-3700. / SJS

PowerPC Chip Prices Go Even Lower

DRIVING DOWN THE PRICE of PowerPC processors once again, IBM and Motorola have announced lower prices for the PowerPC 601 and 604 chips. Lower chip prices may make porting the Macintosh operating system more attractive to potential licensees.

In production as of December, the 604 from IBM will be available to manufacturers for $549. Motorola will be offering the same chip for $599 and a 90-MHz model for $499. Compared to the 100-MHz Pentium, which costs $935, the 100-MHz 604 provides 60 percent greater integer performance and twice the floating-point performance.

The 100-MHz 601+ began production in November. Priced at $399 from IBM and $439 from Motorola, the 601+ runs at the same speed as Intel's 100-MHz Pentium.

All price comparisons are for quantities of 1,000, and speed comparisons are based on estimated SPECmarks. For more information, call IBM at 800-769-3772 and Motorola at 800-845-6686. / SJS

NATIVE POWER MAC APPLICATIONS

THE FOLLOWING IS a list of recently shipped native Power Mac applications.

Business		
ACT 2.0	Symantec	503-335-3322
Groupwise 4.1	WordPerfect	801-225-5000
Persuasion 3.0	Adobe Systems	206-622-5500

Games		
Out of the Sun	Domark	415-513-8929

Multimedia		
metaFlo	Valis Group	415-435-5404

Networking and Communications		
PageNOW!	Mark/Space Softworks	408-293-7299
White Knight 12.0	FreeSoft	412-846-2700

Publishing/Graphics		
Koyn Fractal Studio	Koyn Software	314-878-9125
Photoshop 3.0	Adobe Systems	415-961-4400
QuarkXPress 3.31	Quark	303-894-8888
Typestry 2.1.1	Pixar	510-236-4000

3-D/CAD		
Design Reality	Ashlar	408-746-3900

Utilities		
After Dark 3.0	Berkeley Systems	510-540-5535
Now Utilities 5.0	Now Software	503-274-2800

Other		
Kaleidagraph 3.0.4	Synergy Software	610-779-0522
Print Shop Deluxe 1.1	Brøderbund	415-492-4400
VIP-BASIC	Mainstay	805-484-9400

INFORMATION MANAGERS /
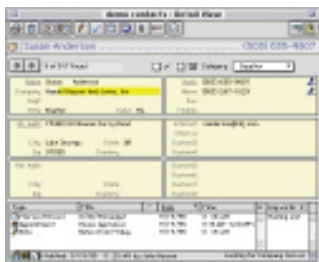# THE PERSONAL GOES PUBLIC
Now Contact teams with Up-to-Date.

PERSONAL IS THE WORD that puts the *P* in *PIM*. But in workgroups, a lot of information is meant to be shared, not hidden away in an inaccessible personal data file. New versions of the components of Now Software's PIM combination, Now Up-to-Date and Now Contact, address that very need by offering improved network information-sharing abilities.

Now Contact. Skipping a version number to synchronize releases with its partner, version 3.0 of Now Contact shares contacts over a network in much the same way Now Up-to-Date shares events. Users can group contacts by category and make categories public or private. Subscribers to public categories get automatic updates of changes.

Now Contact simplifies data entry by automatically completing predictable contact entries, automatically filling in address fields after a company's address has been entered once or completing entries after the first few keystrokes.

Other improvements in Now Contact 3.0 include contact searching by keywords, better file and record synchronization, faster printing, and more customization options. Like its first iteration, Now Contact allows names to be attached to Now Up-to-Date events by use of a simplified process: Dragging a contact onto a Now Up-to-Date calendar automatically attaches it or creates a new calendar event.

Now Up-to-Date. Improved group scheduling

highlights Now Up-to-Date 3.0. Users can have Now Up-to-Date automatically find available meeting times for any combination of individuals and meeting rooms by comparing the free time on all participants' personal calendars.

An improved interface sports an iconographic tool bar that can be used to control viewing options and navigation. Users can also personalize their calendars with included graphics.

In addition, Now Software has fine-tuned some old Now Up-to-Date features. Month and multiday views can now scroll a week or a day at a time, and descriptions and agendas can now be assigned to individual events in a repeating-event series.

Both Now Contact and Now Up-to-Date are individually priced at $65 (upgrade, $39.95). A bundle of the two products sells for $99; introductory deals and multiuser packs are additionally available. 800-237-3611 or 503-274-2800. / Karen J. Ohlson and Jason Snell

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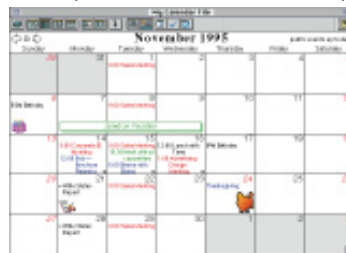
PRINTERS /
Print, Copy, Fax

A TRIPLE THREAT for the home office is a single machine that combines printing, copying, and faxing. That describes Hewlett-Packard's new OfficeJet ($999). In its

monochrome-printer capacity, this 3-ppm inkjet printer offers a resolution of 600 x 300 dpi on letter-sized paper. But it is also a Group 3 (9,600 bps) plain-paper fax machine with a 20-page automatic document feeder and speed-dialing functions.

And like many fax machines, the OfficeJet can also be used as a low-volume photocopier. The OfficeJet accepts paper sizes as large as 8.5 x 14 inches and can reduce images as much as 70 percent while copying.

This triple threat does present a potential Achilles' heel for Macintosh users: It has a Centronics serial interface. But GDT Softworks (604-291-9121) has a solution: PowerPrint ($149), a software/cabling package that lets Macs print to the OfficeJet. 800-852-0900 or 408-725-8900. / JS

STORAGE SYSTEMS /
Micropolis Delivers Fast, Safe RAID

MIXING AND MATCHING is the name of the game with the RAIDION, Micropolis' RAID (Redundant Array of Inexpensive Disks) system. RAIDION offers RAID level 0, 1, and 5 in the same disk subsystem.

With the RAIDION system, Micropolis is targeting off-line video editing, imaging, and prepress for users who need serious data protection. With fault tolerance (RAID level 5) and striping (RAID Level 0) in the same system, you end up

with the best of both security and speed.

The RAIDION centers on a hardware controller called Gandiva, which contains a RISC processor, a proprietary ASIC, a PCI bus, and four Fast SCSI-2 channels designed to outperform single-channel systems. Gandiva enables users to incorporate individual drives into the array, thus allowing the downloading of large files onto an individual drive for easy transport to other RAIDION systems. This is especially useful for moving the hundreds of megabytes of data typical in video production from one machine to another.

Micropolis offers Mac utilities for managing the RAIDION system. The RAIDION is available in three- and four-drive configurations with total capacities of 3.5 and 5.2 GB, respectively. The 3.5-GB system lists for $11,295, and the 5.2-GB system is $13,795. Users can add as many as 28 drives to the RAIDION system, for a maximum capacity of 245 GB in a single array. / Sean J. Safreed

TEKTRONIX TACKLES COLOR LASERS

New Phaser 540 offers photo-realistic printing, simple operation.

THREE THINGS DISTINGUISH Tektronix's new Phaser 540 from the other color laser printers introduced recently: its continuous-tone print quality, its fast print speeds for both monochrome and color, and its easy-to-replace consumables. Plus, an optional duplication station allows for color copying.

The Phaser 540 is the first of the recent crop to use an engine by Matsushita that delivers continuous-tone output that has resolutions of 300- and 600-dpi color or monochrome output. Unlike printers that use dithering patterns to reproduce color gradation, the Phaser 540 varies the color intensity at each pixel to create photo-realistic output. Print speeds for 300-dpi output are as fast as 14 ppm for monochrome and 3.5 ppm for four-color pages. The Phaser 540 is priced at $8,995, which makes it competitive with units from QMS, Xerox, and Hewlett-Packard.

The engine uses monocomponent consumables — each color cartridge contains both toner and developer — which simplifies toner replacement and reduces costs. Tektronix is developing a cartridge-recycling system through its dealers. Drum and fuser assemblies are easy to access as well.

Expect 30,000 pages per drum and 15,000 per fuser.

The Phaser 540 printer is fueled by a 32-MHz AMD 29030 RISC chip with 20 MB of RAM, expandable to as much as 52 MB. It automatically switches among the PostScript Level 2, HP-GL, and HP PCL 5 languages. The unit includes a parallel and a SCSI port. Cards that support Local-Talk ($245), Ethernet ($595), and token ring ($895) are sold separately. A 250-sheet letter-sized paper tray is standard, and two additional trays of the same capacity can be accommodated at the same time.

Users can purchase the optional Phaser CopyStation, a flatbed photocopier that attaches to the Phaser 540. Priced at $1,695, the CopyStation turns the Phaser 540 into a desktop duplicator.

Tektronix has also revealed its new entry-level PostScript inkjet printer, the Phaser 140. Based on Canon's A-161 BubbleJet engine, the 360-dpi Phaser 140 prints on plain paper as well as coated stock. Priced at $1,695, it includes a 16-MHz RISC processor and 8 MB of RAM. 800-835-6100 or 503-682-7377. / Pamela Pfiffner

Point and Click

A REMOTE CONTROL for your Mac? At first glance, Interlink Electronics' RemotePoint sure looks like an oversimplified TV clicker or maybe a primitive *Star Trek* phaser. In reality, the RemotePoint ($199) is an infrared mouse designed for use with multimedia CD-ROMs and in presentations — where nothing more than pointing and clicking is required for operation.

Users move the cursor by pushing on the RemotePoint's top button; a smaller button on the opposite side is for clicking. The mouse's infrared receiver plugs in to a Macintosh's ADB port and can receive signals from as far as 40 feet away. 805-484-1331. / Jason Snell

Trinitron for Less

SETTING NEW STANDARDS for low-cost monitors, Sony has released a 14-inch Sony Trinitron monitor — with extra goodies Apple's Macintosh Color Display doesn't offer — for less than $400.

The Sony CPD-1425 includes a 14-inch Super Fine Pitch (.25-mm aperture-grille pitch) Trinitron tube that includes an anti-static, antiglare coating. Although not truly autosynchronous, in that it doesn't work over a broad range of frequencies, the monitor is compatible with Mac 640-x-480- and 832-x-624-pixel resolutions, plus PC VGA resolutions as high as 1,024 x 768 pixels.

Priced at $399.95, the CPD-1425 features autoshutdown capability that conforms with Energy Star requirements and meets Swedish MPR-II emissions standards. Sony doesn't provide a Macintosh cable with the monitor; you must purchase a MacView adapter, for an additional $18.95. 800-352-7669. / Jeffrey S. Pittelkau

MacUser Goes Netsurfing

THE WORLD WIDE WEB just got a little more crowded. Macintosh users on the Internet should soon be able to access information about *MacUser* with their favorite Web browser. All you have to do is point to the URL http://www.macuser.ziff.com/~macuser/. Files on the site will include important *MacUser* stories such as this issue's feature on low-cost color printers and our review of Adobe Photoshop 3.0. Want to get on the Net? Check out "Plug In to the Internet" (September '94, page 86) and "Shopping for Internet Access" (December '94, page 133). / JS

NEW & NOTABLE

HARDWARE /

Dataproducts Typhoon 20. Boasting a print speed of 20 letter-sized pages per minute, this 800-dpi printer also accepts paper sizes as large as 11 x 17 inches. Powered by a 25-MHz RISC processor, the Typhoon 20 supports Adobe PostScript Level 2, emulates PCL 5+, and comes with 8 MB of RAM. LocalTalk and parallel ports are standard, with Ethernet available as an option. $5,095. 818-887-8000 or 800-980-0374.
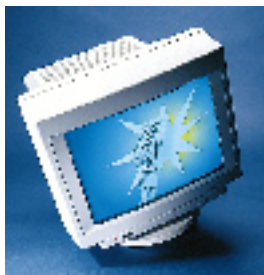
▼ **Tatung Audio 15.** This 15-inch monitor with a flat, square tube sports built-in stereo speakers and can display resolutions as high as 1,024 x 768 inches. A front digital control panel lets you adjust the monitor's brightness, contrast, and so on. $499. 213-979-7055.

U.S. Robotics Sportster V.34. One of the first V.34 modems, offering a top speed of 28.8 kbps, the Sportster V.34 is additionally compatible with V.fast 28.8-kbps and V.32bis 14.4-kbps modems and is also Group III (14.4 kbps) fax-compatible. $369. Owners of Sportster V.FC modems can upgrade for a $29 fee. 800-342-5877 or 708-982-5010.

Elo IntelliTouch. With a connection to the Mac's ADB port and special MonitorMouse software, this 17-inch flat-square monitor becomes a touch screen. The IntelliTouch offers display resolutions as high as 1,280 x 1,024 pixels. $2,070. 615-482-4100.

Griffin Communications Composite Sync Adapter. This small adapter allows newer-model Macintoshes to use older monitors that employ the "sync on green" video standard. The adapter works with Power Macintoshes, the AV-model Quadras, the Quadra 605, the LCs, and the PowerBooks that have video-out capability. $35. 615-256-6913.

Epson ELP-3000. Weighing in at 17 pounds, this liquid-crystal projector can display the contents of a computer screen at sizes as large as 300 inches. The ELP-3000's maximum resolution is 640 x 480 pixels, and the projector can render images in 24-bit color. Because the Epson ELP-3000 includes standard video inputs, no adapters or converters are required. $8,999. 310-782-0770.

SOFTWARE /

Inspiration 4.1. The latest version of this idea-development tool includes improved outline commands, a spelling checker, the ability to import RTF files, and nearly 500 symbols for use in creating flowcharts of ideas. $129; upgrade, $25. Inspiration Software. 503-245-9011.

MapInfo 3.0. Improved data-display tools highlight the new release of this mapping package. MapInfo 3.0 allows users to mix maps with scanned images, create various types of multiple-variable charts, and reorder geographic territories as their data changes. $1,295; upgrade, $299. MapInfo. 518-285-6000.

DecisionMaker. A tool to aid in the decision-making process, DecisionMaker helps users create "decision trees," which help in weighing different decisions and the probability of possible outcomes. Included with the package is a guide to help users learn to use this analysis technique effectively. $150. Palo Alto Software. 503-683-6162.

Koyn Fractal Studio 2.1. Now native on the Power Mac, this application allows users to create fractal-based images, whether they are patterns or images resembling natural objects such as trees or snowflakes. Knowledge of fractal concepts is not required, but savvy users can edit their fractals. Images can be created in up to 24-bit color with resolutions as high as 2,540 dpi. $119.95. Koyn Software. 314-878-9125.

Christmas Lights. ▼ For the Mac user who can't get enough of the holiday spirit, this collection of animated Christmas and Hannukah lights, ornaments, and nonreligious symbols can be placed all over the Mac desktop. Also included is a snowstorm screen saver. $20. Atticus Software. 203-348-6100.

Opus 'n Bill on the Road Again. Ackpth! Opus the Penguin and Bill the Cat, the stars of Berkeley Breathed's *Outland* comic strip, travel all around the world (and even onto the Information Superhighway) in this sequel to last year's Opus 'n Bill Screen Saver. This package includes 16 animated modules in addition to version 5.0 of the Intermission screen-saver engine. $40. Delrina. 408-363-2345.

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of October 5, 1994. Prices (except those for compact models and Performas) do not include a monitor or a keyboard. The United Computer Exchange is a national clearinghouse of used microcomputer equipment.

Mac Model	New	Used
SE/30 (5/40)	•	$550
Classic II (4/40)	•	$500
Color Classic (4/80)	•	$700
LC II (4/40)	•	$425
LC III (4/80)	•	$500
Performa 475 (4/160)	$1,299	$1,075
Performa 550 CD (5/160)	$1,599	$1,425
Performa 575 CD (5/250)	$1,849	$1,750
IIsi (5/40)	•	$425
IIci (5/80)	•	$650
IIfx (8/160)	•	$900
IIvx (4/80)	•	$850
Quadra 605 (4/80)	•	$650
Quadra 610 (8/160)	•	$1,050
Quadra 650 (8/230)	•	$1,475
Quadra 660AV CD (8/230)	•	$1,450
Quadra 700 (8/230)	•	$1,350
Quadra 800 (8/230)	•	$2,100
Quadra 840AV CD (8/230)	•	$2,325
Quadra 900 (8/230)	•	$1,700
Quadra 950 (8/230)	$3,599	$2,500
Power Mac 6100 (8/250)	$1,749	$1,550
Power Mac 7100 (8/250)	$2,499	$2,250
Power Mac 8100CD (8/250)	$3,899	$3,500
PowerBook 145 (4/40)	•	$825
PowerBook 145B (4/80)	•	$800
PowerBook 150 (4/120)	$1,449	$1,400
PowerBook 160 (4/80)	•	$1,275
PowerBook 165 (4/80)	•	$1,350
PowerBook 165c (4/80)	•	$1,450
PowerBook 170 (4/40)	•	$1,325
PowerBook 180 (4/80)	•	$1,800
PowerBook 180c (4/80)	•	$2,100
PowerBook 520 (4/160)	$2,099	$2,050
PowerBook 520c (4/160)	$2,699	$2,600
PowerBook 540 (4/240)	$3,099	$3,000
PowerBook 540c (4/320)	$4,699	$4,625
Duo 210 (4/80)	•	$775
Duo 230 (4/120)	•	$950
Duo 250 (4/200)	•	$1,500
Duo 270c (4/240)	•	$2,050
Duo 280 (12/240)	$3,099	$2,875
Duo 280c (4/320)	$3,599	$3,150

• = discontinued model

For more pricing information on these and other models, call 800-755-3033 or 404-955-0569, or find it on ZiffNet/Mac, in Library 1 (Special Reports) of the MacUser Forum (GO ZMC:MACUSER). On AppleLink, look for it in ZiffNet Selections:MacUser Software: Reference. On eWorld, go to shortcut MACUSER, in MacUser Software Library:MacUser Special Files.

Adobe Photoshop 3.0 / Layer support and precision design controls in one RAM-hungry program.

UNLEASH YOUR CREATIVITY and explore the power of filters and effects more easily than before with the latest version of Adobe Photoshop. Version 3.0 introduces support for multiple layers, so you can apply effects and move text and images without affecting backgrounds. A new palette design reduces screen clutter, filter previews save you time, and you can select and change colors with greater precision.

But the creative flexibility you gain exacts a heavy price in RAM and hard-disk-space requirements, especially if you're working with large files. And color control, although somewhat improved, is still not as exact as we'd like for professional prepress work.

Layered Look

Version 3.0's newly added support for multiple layers lets you stack image elements and move or delete them without affecting the background. With earlier versions of Photoshop, once you placed an element, removing it removed the background as well.

You can also control the transparency of the image elements on each individual layer with a slider in the Layers palette. You can even apply a mask to a layer, rather than to an entire image. The layer mask is an 8-bit alpha channel, just like a traditional channel mask, and it appears in the Channels palette. However, a layer mask affects only the layer it's associated with, and you can have only one layer mask per layer, whereas a channel mask has an effect on your entire image and there is no limit to the number of channel masks that you can use.

By applying a mode to a layer, you can affect how the layer interacts with underlying pixels on other layers. For example, when you create a layer by using Darken mode, only the pixels in the layer that are darker than underlying pixels are blended into your image. Since you're changing only the way the layer interacts with other layers, instead of changing the layer itself, applying Normal mode removes the effect.

Customizable Palettes

Less obvious than the layers feature but more important for everyday use are changes to Photoshop's interface. Groups of palettes float on your desktop, and each palette has a tab. By default, the palettes appear in three groups: a Brushes and Options group; a Picker, Swatches, and Scratch group; and a Layers, Channels, and Paths group. You can organize the palettes in any way you wish: For instance, if you want to place the Layers palette in your Brushes and Options group, you can move it by dragging its palette tab into the Brushes and Options group.

Working with channels and layers independently of your image is easier with version 3.0. Both the Channels and the Layers palettes have optional thumbnails that show you the contents of each channel or layer, respectively. However, each time you open or change a file, Photoshop also takes time to change your thumbnails, which can cause your pull-down menus to become noticeably sluggish.

Version 3.0's layers also make it easier to apply drop shadows and smooth gradations. You can load a channel as a selection by Option-clicking on it in the Channels palette. You can also load the image elements in a layer as a selection by choosing the layer and pressing Command-Option-T.

Other features improve precision for detail work and simplify mundane tasks. A new Preferences option makes your cursor the same size as the paintbrush you're using, which is particularly practical when you're using a pinpoint brush for detail

Reviews | Rating Key

🌶🌶🌶🌶🌶	Outstanding
🌶🌶🌶🌶	Very Good
🌶🌶🌶	Acceptable
🌶🌶	Poor
🌶	Seriously Flawed
💣	Dangerous

work. You can drag a selection from one document directly into another without cutting and pasting. And although a few tools had keyboard equivalents in Photoshop 2.5.1, every tool has one now. Some keyboard equivalents even let you toggle between options by repeatedly invoking the command.

We also welcome Photoshop's new filter preview, which lets you view a filter's effects before the filter is applied. You can select the area you want to preview simply by clicking on it.

Veteran Photoshop users know that using the magic-wand tool to accurately select an area you want to remove from an image can be time-consuming and frustrating. The new Color Range command helps by letting you select areas based on color, using the eyedropper tool. The Fuzziness slider controls the tolerance. The new Replace Colors command also uses the eyedropper tool and the Fuzziness slider to let you apply new hue, saturation, and brightness levels to an area.

Other new, creative options include the Lighting Effects filter, which allows you to apply multiple light sources to an image, and the Clouds filter, which renders realistic-looking clouds.

Color Control

A welcome and long-overdue feature in version 3.0 is selective color correction, which lets you adjust the ink amounts for a given plate. You can increase the amount of yellow ink your printer uses to print greens, for
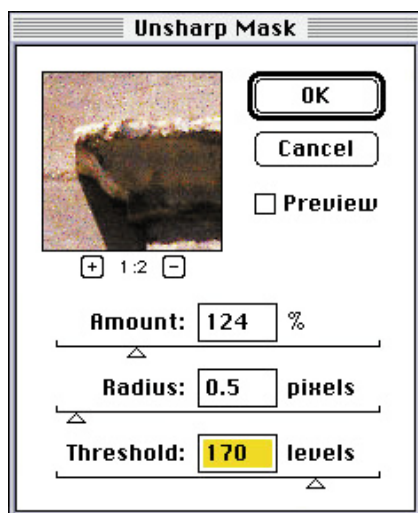
Preview the results of your effects before you apply them in Photoshop 3.0.
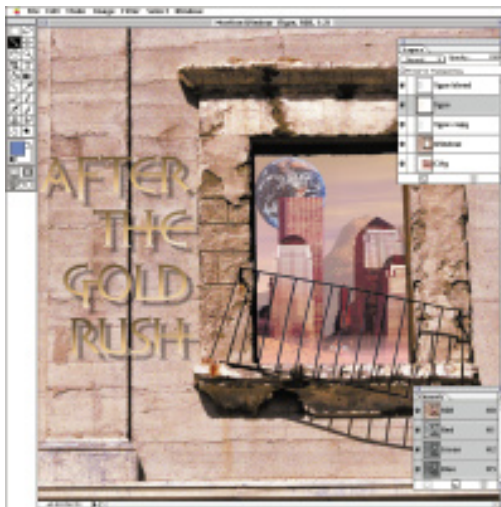
Support for multiple layers makes the creation of drop shadows and the positioning of text a cinch with Photoshop 3.0.

example, or reduce the amount of cyan used for reds. A new CMYK Preview option lets you see what your file will look like in CMYK mode without your putting your image through a mode change. Unfortunately, the CMYK preview is only as accurate as your monitor.

An alternative to the clumsy way Photoshop handles out-of-gamut colors (that is, simply clipping those colors into gamut instead of evenly scaling color throughout a document) is the Gamut Warning, which identifies the out-of-gamut colors in an image for you. You can change the out-of-gamut colors or use the new sponge tool to desaturate them.

As useful as this may be, it's a kludgey workaround, especially if you need saturated colors in your image; the color-separation engine is basically unchanged. If you hoped for features such as the ability to lock a densitometer probe on an area while adjusting curves and levels, you'll have to keep waiting.

Photoshop also doesn't have global color correction, which is particularly inconvenient if you're working with several layers: You can't make a color correction on one layer and apply that change to all layers in your document unless you are willing to merge your layers.

Ravenous for RAM

The RAM requirements for serious production work involving Photoshop 3.0's new layers are formidable if you want to work at a reasonable pace. Overall, our tests found

that Photoshop 3.0 is not much faster than Photoshop 2.5.1. Running native on Power Macs, it's about 3 to 15 percent faster than Photoshop 2.5.1 with the PowerPC Accelerator plug-in. On 680x0 Macs, it's generally 5 to 10 percent faster than Photoshop 2.5.1 for most operations, but for a few, such as applying a Gaussian Blur with a 2.1-pixel radius, it's slightly slower than its predecessor.

The relationship between speed, RAM, and file size is still the same: You need at least three times the file size in RAM for optimum performance. If you're compositing three 18-MB Photo CD files, for example, your file size balloons to 54 MB and you'll need at least 170 MB each of RAM *and* scratch disk space. That is because the virtual-memory scheme of Photoshop has been revamped so that you must now have as much scratch disk space as you have RAM allocated to Photoshop. So if you've set Photoshop to use 250 MB of RAM, you'll need 250 MB of free disk space or else you'll get messages telling you that the scratch disk is full, even if you're just working on a 10-MB file.

The Bottom Line

The user-interface improvements in Photoshop 3.0 are, in themselves, sufficient reason to upgrade. But the demands the program places on RAM and disk space are a real concern. We welcome Photoshop 3.0's new features, but they push the Mac to, and even beyond, its limits: Suddenly a Power Mac with 128 MB of RAM doesn't seem so powerful any more. / Bruce Fraser

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Adobe Photoshop 3.0.1

Rating: ♦♦♦♦

Price: $895 (list).

Pros: Improved interface, including more-precise and more-flexible selection tools and new creative features, such as lighting. Layers support.

Cons: Needs hefty amounts of RAM and disk space for reasonable performance. No global color correction.

Company: Adobe Systems, Mountain View, CA; 800-833-6687 or 415-961-4400.

Reader Service: Circle #401.

Now Utilities 5.0 / Now Software does System 7.5 one better with this upgrade to its utilities package.

IF WE COULD BUY only one utility package, we'd make it Now Utilities 5.0. Some of its classic features are now standard in System 7.5, and some of its new ones were already available in other utilities, but even if you upgrade your system and throw in several hundred dollars' worth of add-ons from other vendors, you still won't end up with all the time-saving tools Now Software delivers in one bargain-priced box.

Polished Favorites

Of the ten modules that make up the new release, the flagship items remain Now Super Boomerang and Now Menus. Super Boomerang puts a superfast Find command and menus of files and folders you use frequently and have opened recently where you need them most: in Open and Save dialog boxes and in submenus to the Open command in applications. Super Boomerang hasn't changed much in version 5.0, but on Power Macs, native code speeds up searches for text within files. Now Menus, in addition to providing hierarchical submenus for the Apple menu, lets you create custom launch menus and keyboard equivalents. New in version 5.0 is an option to put custom menus, complete with their own icons, right on the menu bar.

System 7.5 comes with Apple Menu Options, an extension that adds submenus to the Apple menu, including menus of recently used documents, applications, and servers. It's a useful enhancement to the standard Mac interface, but it's no match for the more versatile Super Boomerang/Now Menus tag team.

The Extensions Manager in System 7.5 competes with a third popular Now Utilities module, Now Startup Manager, and again Now Utilities wins hands down. Each lets you turn extensions on and off and create

The Now Menus module in Now Utilities 5.0 has customizable pull-down menus.

sets of extensions for specific tasks, but Startup Manager offers a variety of additional options, including the ability to load related extensions together and avoid known extension conflicts. Version 5.0 adds a semiautomated testing procedure to help you diagnose extension-related problems quickly — a valuable feature borrowed from Casady & Greene's Conflict Catcher II.

Most of the other modules carried over from Now Utilities 4.0 show relatively minor improvements in version 5.0. Now WYSIWYG Menus, which displays font names in the matching typeface and puts members of the font family into submenus, lets you create different font sets for different applications. Both Now Scrapbook, an enhanced alternative to the standard Apple Scrapbook, and Now Profile, a utility that collects system-configuration information, support Apple's PowerTalk messaging system, so you can send a logo to a colleague or a system profile to your administrator without opening a special mail program.

Now Save, an extension designed to save your work automatically, no longer has to be completely on or off — you can set it to work with selected applications only and tell it to prompt you to save instead of doing so on its own. But some features still aren't compatible with Microsoft Word and Excel, and in our tests, KeyCapture — an option that is supposed to record, in the background, all keystrokes to a text file — missed so many keystrokes that the files it created were gobbledygook (when they weren't completely empty!).

New Faces

Neither of the two modules new to Now Menus 5.0 is exactly original, but both can be useful if you don't already have other software that does what they do. Now

QuickFiler, a direct descendant of the discontinued Now Compress, is a file-compression utility that rivals Symantec's Norton DiskDoubler Pro and Aladdin's StuffIt Deluxe in performance and features — among other options, it can compress files automatically when your Mac is idle.

Now QuickFiler also offers a search feature called Now Find, which can not only locate files by criteria such as name and type but also search through files for specific phrases. Unfortunately, it takes twice as long to find a file as System 7.5's Find File feature and five times as long as Super Boomerang's separate Find command.

The other new member of Now Utilities 5.0, Now FolderMenus, is a stripped-down clone of Inline Software's PopupFolders. It creates hierarchical pop-up menus showing the contents of any folder or volume icon you click on in the Finder; by navigating the submenus, you can dig down to a file or folder as many as five levels deep without opening a single window.

The Bottom Line

Aside from the Now Save problems, Now Software has confirmed compatibility problems with Aldus' DateBook Pro and with Apple's Control Strip for PowerBooks, and in some cases, Now Utilities 4.0 Preferences files cause the new version to crash (so you need to delete them before installing version 5.0).

The glitches are relatively few and far between, though, and for those who do run into intractable problems, Now Software offers a 60-day money-back guarantee. Few users who have experienced the everyday convenience and overall value these utilities deliver are likely to go back willingly to life without them. / Henry Norr

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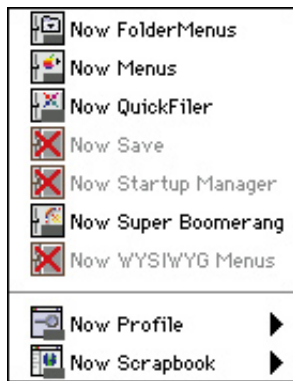
Now Utilities 5.0

Rating: ♦♦♦½

Price: $89.95 (estimated).

Pros: Numerous shortcuts. New version adds key features of other utilities, including compression and conflict diagnosis, at a bargain price.

Cons: Most new features unoriginal. Now Find is slow. Now Save's KeyCapture is unreliable. Some incompatibilities.

Company: Now Software, Portland, OR; 800-689-9427 or 503-274-2800.

Reader Service: Circle #402.

QuickMail 3.0 / CE Software enhances its mail package, but the result is no special delivery.

AT FIRST GLANCE, CE Software's Quick-Mail 3.0 appears to sport lots of flashy new features — built-in spell checking, rules-based routing of messages, and a Search command for finding messages. But dig a little deeper, and you'll find that not all of QuickMail's new features are everything they're cracked up to be. What's more, some old demons from QuickMail's past haunt this upgrade, which feels more like a version 2.7 than a 3.0.

Managing Mail

Anyone who's ever been embarrassed by spelling errors in an important e-mail message will appreciate QuickMail's new built-in spelling checker. You can add your own words to the dictionary and use the Replace All and Ignore All commands to save time.

The spelling checker is the best new feature in QuickMail 3.0. MailManager is a feature that *sounds* like it could be useful, but it falls flat. It can automatically reply to, forward, file, print, or delete incoming messages by priority and by text in the subject, date, sender, and to fields and in the body of the message. Unfortunately, you can look for a single text string only. For instance, although you can file, forward, and reply to an urgent message that has the word *Mexico* in it, you can't set up a filter to print messages containing *Mexico* but not *Valdez account.* You also can't choose, for example, to filter messages from different senders by assigning them different priorities or deal differently with messages on which you are cc'd.

You probably won't use MailManager anyway, because it has a deleterious effect on performance if you leave it on. Because

MailManager processes every incoming message — including return receipts — it brings your machine to a halt for several seconds whenever you receive a message, even when you are working in another application.

The new Search command has the same criteria limitations as MailManager. Also, it can search through only filed messages that reside on your Mac, not messages residing on the server. This means that you must file all of your messages before you can use the feature. As with previous versions of Quick-Mail, you can't access filed messages remotely or from another Mac, even if you use Apple Remote Access to dial in to your QuickMail account. Fortunately, the maximum number of filed messages a folder can contain has been increased from 100 to 250.

Falling Behind

The new features mean that QuickMail takes up more hard-disk space (2 MB, twice as much as version 2.6), and quite a few old problems persist in QuickMail 3.0. The client software has been upgraded, but the

version 3.0 server software is unchanged from version 2.6.4 except for minor bug fixes. (The version 3.0 client software works with servers that use version 2.5 and later.)

This means that QuickMail servers still don't automatically exchange directories (lists of users), so when you add a user to one QuickMail server, the other servers won't know about it. To send a message to an address not on their server, users must search for it, using QuickMail's Find button, copy an address in the From field of an incoming message, or use the Special button to manually create the address. However, adding an address to a user's address list is somewhat easier now, and you can also print, import, and export address books.

The old server software falls behind competing e-mail systems in other ways as well. Unlike SoftArc's FirstClass, which stores forms on users' hard disks, QuickMail sends entire graphical forms over the network, which has the effect of increasing network traffic — and slowing network speed in the process.

QuickMail Remote remains a separate application, unlike FirstClass and Novell GroupWise, which each have client applications that can be used both on a network and for a direct dial-in connection. Since QuickMail Remote has not changed with this new version of QuickMail, users still can't create mail off-line.

Even the newly revamped QuickMail client software contains old problems. In this age of Apple-events-enabled applications, the QuickMail 3.0 client software still makes little use of background processing. You can't send or open messages in the background or do background enclosure downloading. You can't even receive a message cleanly in the background: When you're typing a memo in QuickMail and a message arrives, QuickMail loses your last few keystrokes. If a message arrives while you're selecting messages to read, you lose the selection you've made. You also still cannot enclose folders, as you can with other e-mail packages, and you are still limited to 16 enclosures.

The Bottom Line

QuickMail was innovative in its time but has now fallen behind. Missing from QuickMail 3.0 are many features found in competing mail packages, such as the ability to send and receive messages in the background and directory synchronization. For current users of QuickMail, there isn't much reason to upgrade to version 3.0, and people looking for their first mail system might do better to look elsewhere. / John Rizzo

QuickMail 3.0

Rating: ♦♦♦

Price: 10-user pack, $649 (list).

Pros: Built-in spelling checker.

Cons: MailManager has limited usefulness and takes over Mac when processing messages. Can search through only filed messages. Can't exchange directories. No background processing.

Company: CE Software, West Des Moines, IA; 800-523-7638 or 515-221-1801.

Reader Service: Circle #403.

Tektronix Phaser 440 / Faster, cheaper dye-sub printing for the rest of us.

BIGGER ISN'T ALWAYS BETTER, and that's especially true for printers when it comes to form factor and price. The color-printer experts at Tektronix have designed a successor to their acclaimed Phaser IISDX dye-sublimation printer that's not only cheaper and smaller but also faster. The new Phaser 440 is a great office printer for workgroups that need near-photographic quality for full-bleed letter-sized output. And the best news of all is the cost — at a list price of $7,995, the Phaser 440 is several thousand dollars cheaper than the Phaser IISDX.

Speed Factor

The Phaser 440 comes equipped with a speedy new two-page-per-minute Sharp engine, Adobe PostScript Level 2, and an AMD 29000 RISC processor. LocalTalk, RS-232, SCSI, and parallel ports are standard, and an EtherTalk option is available for $495. The printer's universal paper tray accepts letter- and A4-sized paper as well as a new size Tektronix calls letter extra. Several inches wider and longer than letter-sized paper, letter-extra paper lets the Phaser 440 print full-bleed 8.5-x-11-inch images. For those who need more than the single paper tray, an assembly with a lower tray is available for $495.

The Phaser 440 comes standard with 16 MB of RAM — enough to support letter- and A4-sized images printed in three colors (cyan, magenta, and yellow). If you want to print letter-sized images using four colors (cyan, magenta, yellow, and black), you'll need 32 MB of RAM. Tektronix sells a 16-MB RAM-upgrade kit for $1,595.

The most intimidating aspect of using dye-sub printers is setup, which may involve external RIP boxes, SCSI configurations, and maybe even a host Mac to run a software interpreter. The Phaser 440, however, is one of the easiest dye-sub printers to set up. You simply install the ribbon in the transfer roll tray, slide the tray into the printer, load the paper, and select a protocol and network connection.

The Phaser 440 software comprises a special modified version of the LaserWriter 7.1.2 printer driver, which provides access to paper sizes and color-correction modes, and a set of utilities for color correction. The printer offers several built-in color-correction modes for press matching —

Compact and fast for a dye-sub printer, the $7,995 Phaser 440, from Tektronix, is a good choice for workgroups looking for affordably priced high-quality color printing.

commercial, SWOP, SNAP, and Euroscale — and two for photographic use — Vivid Blues and Simulate Display. Tektronix also provides PostScript Printer Discriptions (PPDs) for use with the LaserWriter 8 driver and supplies a Photoshop Export filter that speeds printing by bypassing the PostScript interpreter and sending data directly to the printer.

The Phaser 440 also comes with TekColor Photofine, which improves the resolution for text and line art and enhances color shading for continuous-tone images, which helps improve skin tones and the like.

Sibling Rivalry

To find out just how much faster the Phaser 440 is than its predecessor, the Phaser IISDX, we used a variety of test documents — a complex Adobe Illustrator document, a 7-MB Adobe Photoshop document containing a photographic image with skin tones, a QuarkXPress document containing different types of files (such as TIFF and PICT), and a five-page Microsoft PowerPoint document incorporating business graphics. Our test platform was a Quadra 650

equipped with 40 MB of RAM and built-in Ethernet.

As we expected, the Phaser 440 outperformed the Phaser IISDX in every one of our tests. It shaved a full minute off the Phaser IISDX's 5-minute print time for the Photoshop document and almost 2 minutes apiece off the IISDX's print times for the Illustrator and QuarkXPress documents. But the most noteworthy speed gain occurred in printing our five-page PowerPoint document — the Phaser 440 chopped a whopping 8 minutes off the Phaser IISDX's 22-minute print time.

Not only does the Phaser 440 print quickly for a dye-sub printer but it also delivers superb output quality. For continuous-tone images, the output shows excellent color registration, consistent tonality, even skin tones, and crisp knockouts. For text and line art as well, traditionally the Achilles' heel of dye-sub printers, the quality is pretty good. You won't mistake it for laser-printer output, but it's among the best we've seen from dye-sub printers.

The Bottom Line

The Tektronix Phaser 440 is easy to set up, fast enough to satisfy the color-printing demands of most workgroups, and inexpensive enough to appeal to budget-minded business managers. Output quality is excellent for continuous-tone images and quite acceptable for line art and text. All things considered, Tektronix has produced a winner. / *Roman Victor Loyola*

Tektronix Phaser 440

Rating: ♦♦♦♦½

Price: $7,995 (list).

Pros: Plug-and-play setup. Impressive speed for dye-sub printing. Excellent output quality for continuous-tone images.

Cons: Extra RAM required for four-color printing.

Company: Tektronix Color Printing and Imaging Division, Wilsonville, OR; 800-835-6100 or 503-682-7377.

Reader Service: Circle #404.

FirstClass 2.5 / SoftArc's versatile software wins high marks for e-mail, conferencing, and BBSs.

FIRSTCLASS' STELLAR ABILITIES as a BBS (bulletin-board system) are well known, but the program's other groupware talents, such as e-mail and conferencing, have mostly been overlooked. In its latest version, FirstClass fortifies its e-mail and conferencing abilities as well as its robust BBS architecture.

In-House BBS

To broaden FirstClass' appeal, SoftArc has added e-mail features that make the program a feasible alternative to Microsoft Mail or CE Software's QuickMail for many users. FirstClass users can now unsend messages, automatically reply to or forward received messages, tag messages for private delivery and route them over specific gateways, and create their own address books. The forms-generation tool lets an administrator create personalized forms for any kind of communication. In our tests, all these features worked flawlessly. Since FirstClass works as a BBS as well, dialing in for e-mail messages was easier than with QuickMail Remote.

As a BBS, FirstClass offers many of the same features that commercial on-line services such as America Online and CompuServe provide. FirstClass users have a password and a personal mailbox and are able to send and receive correspondence. They also have access to global information, such as a discussion board, and are able to participate in live chat sessions. Optional protocol tools enable users to send faxes, access SQL and DAL databases, and connect to the Internet. FirstClass comes with an extensive selection of files to facilitate modem connections.

Groupware Deluxe

Whether you use FirstClass as an e-mail system, conferencing program, BBS, or combination of any of these, you install it on a server and use the Tools application to configure it, setting, for instance, user names and dial-in or network access. After you've set up the FirstClass server, the Post Office folder — or folders — holds all mail

and routing information. With the exception of a conflict with Apple's Modern Memory Manager, our server installation worked flawlessly. Windows client software is available that allows seamless interoperability among Mac and Windows users, but we didn't test it.

The administrator has full access to the FirstClass server and its Post Offices from
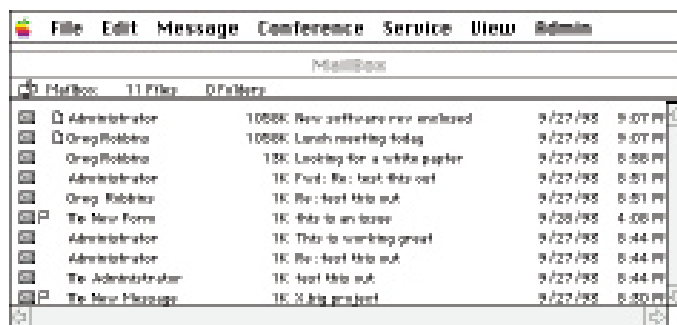
any Mac on the network. As the administrator, you can add or delete FirstClass users and define their access privileges. You create and control the content of the BBSs (often called public folders on e-mail systems). You can also give individual users, such as BBS-forum sysops, full control over conferencing or live chat sessions. Because of all the setup and configuration options, we found it easy to misconfigure clients and conferences, even though the extensive documentation clearly explains features and options. For those who need it, SoftArc's tech support is excellent.

Security is a problem, however. Although FirstClass encrypts all data as it passes through the system, the files on the server are not encrypted, so you have to keep the server in a secure location where users won't have access to it. The administrator has full access to all files. We'd like to see consistent encryption schemes that provide data security throughout the system.

The FirstClass server software costs only $95 and comes with licenses for two regular users (that is, users who have access both through the network and via modem); each additional license costs $15 to $79, depending on how many licenses you buy at once.

Licenses for dial-in access cost considerably less — only $2.50 to $8 per license. You can distribute the client software freely.

If your users are familiar with Macs, using the client software should come naturally. It looks like the Finder, with a floating tool palette for creating, reading, and sending mail. Files and folders can be viewed as icons or stacked according to name, size, kind, label, or date. FirstClass also comes with a default help conference that installs on the server: Users can enter this conference and read topics about using FirstClass. Additionally, a modem script that comes with the client software logs a user on to

Whether you use it as a BBS or an e-mail system, files and messages are easy to access with SoftArc's FirstClass.

SoftArc's information-and-support BBS. The client software doesn't have Balloon Help for quick reference.

The Bottom Line

With the introduction of FirstClass 2.5, SoftArc has successfully created a comprehensive e-mail system with direct and remote access, a practical live-conferencing tool, and a state-of-the-art BBS. Its excellent features and fantastic reliability make FirstClass shine as the premier groupware application. / *Blake Roberts*

White Knight 12.0 / Updated telecommunications program rides high in the saddle.

A LONGTIME FAVORITE of Mac enthusiasts, White Knight was the first telecommunications program for the Mac. The latest version boasts another distinction — it's the first full-featured telecommunications program available for the Power Mac. In

With FreeSoft's White Knight 12.0, you can dial in to any BBS. With a phone book, you can also have the program dial several busy BBSs in succession and connect you via the first free line.

addition, White Knight 12.0 supports a wider range of terminal emulations than the previous version, including VT200 and PC-ANSI color screens, and it offers support for Apple's Communications Toolbox, Apple events, publish-and-subscribe, and AppleScript. No matter where you want to go on the information superhighway you've heard so much about, White Knight 12.0 has the tools to get you there.

White Knight is quite serviceable for knowledgeable users and its scripting facilities are among the most powerful we've seen in a telecommunications program, but its interface, including double-key command equivalents, remains a disappointment. Marginal improvements aside, White Knight still looks and feels much like it did when it was first released.

Scripting Prowess

White Knight's best-known feature is its built-in scripting language, which is documented superbly in the manual. The program calls scripts *procedures,* and when it compiles them, it saves a source-code file separately from the object-code file. This approach has advantages: Like a locked

template, the source-code file cannot be changed unless you reprogram and re-compile it, but you can change the object-code file appropriately for different BBSs or call-out locations. For further security, the source-code files are encrypted and password-protected, so BBS-account information — your log-on password, for instance — isn't easily accessible.

For those who do not find the scripting language powerful enough, White Knight now includes a BASIC-language extension. A developer's tool kit is available separately for people who want to create custom applications, new modem drivers, custom dialog boxes, and RCMDs (program extensions much like HyperCard's XCMDs) in C or Pascal.

Quick Access

When you use White Knight to sign on to your favorite BBS for the first time, you build a Settings file containing the protocols and modem speeds — for example, 8 data bits, no parity, 1 stop bit, 9,600 bps — for each service. As you log on to a BBS, you can use the Write for Me option, which records actions such as typing your log-on passwords and retrieving mail and saves them as procedures.

White Knight supports as many as 30 easy-to-program macro buttons, which you can employ to execute a variety of procedures. For those who frequently capture text, White Knight's customizable text filters are useful for editing out unwanted text, such as UNIX line feeds. If you regularly engage in on-line conferences or live chat sessions, the Buffered Keyboard can be a face-saving assistant — when activated, it allows you to check spelling and grammar and quickly review what you're about to say.

Automatic Dialing

White Knight's phone books let you store all the numbers to your BBSs in one place, with links to the correct settings and procedures for each one. Each entry also has a notes field, in which you can keep your account number, log-on password, and other notes, for future reference. You can password-protect and encrypt your phone books in order to keep information away from prying eyes.

You can set up phone books for various sorts of BBS surfing — for instance, you might have one phone book for work, containing procedures for checking a business BBS for news and downloading Tid-BITS from CompuServe, and another phone book for home, for dialing in to chat on America Online and downloading the events schedule from your Mac user group's BBS. If you tend to dial in to several BBSs that are frequently busy, you can mark them and have White Knight dial in to each, one after another in the background, until a line opens up.

Although it can connect you quite well, White Knight doesn't provide any special tools for navigating the Internet; for that, you need to avail yourself of Eudora or Mosaic.

The Bottom Line

From a purely interface perspective, White Knight may not be the most attractive telecommunications program for the Mac, but it is functional and powerful. With the wide range of terminal emulations it supports, you can dial in to just about any BBS. Its scripting facilities are particularly impressive, especially since it works so well with the Macintosh operating system, which makes it an attractive choice for power users and developers. / Mitzi Waltz

White Knight 12.0

Rating: ⟊⟊⟊½

Price: $139 (list).

Pros: Advanced scripting capabilities. Well-written manual. New macro buttons. Encryption and password protection for phone books and scripts.

Cons: Clumsy interface. No navigation tools.

Company: The FreeSoft Company, Beaver Falls, PA; 412-846-2700.

Reader Service: Circle #406.

SoundEdit 16 / CD-quality audio on a monaural Mac.

WITH AV TECHNOLOGY and PowerPCs advancing the art of noise on the Mac, everything makes some kind of sound these days. Much of it is of the 16-bit, or audio-CD-quality, variety. As Sound Manager 3.0-aware software (Sound Manager is included), SoundEdit 16 lets you play and edit 44.1-kHz, 16-bit sound files on your Mac even if it isn't a 16-bit-capable AV Mac, Power Mac, or 500-series PowerBook and you don't have a 16-bit-sound card. You can

Whether or not you have a 16-bit-capable Mac, you can play and edit CD-quality sound with SoundEdit 16.

even use SoundEdit 16 to turn 16-bit sounds into 8-bit, 22-kHz sounds that can play on *any* Mac with little loss in sound quality.

SoundEdit 16 still has the same Controls palette — with Record, Stop, Pause, and Play buttons — and waveform-editing window as in previous versions of SoundEdit, but new features abound beneath the refined surface. Among the best is QuickTime support (including support for QuickTime 2.0), which lets you record and edit sound and synchronize it with QuickTime movies, so you can add a sound track to your formerly silent productions. Frames from a QuickTime movie appear directly over the main audio window, so even first-time multimedia artists can add sound to audio. Since it is a sound utility, *not* a MIDI program, SoundEdit cannot sync MIDI files to QuickTime 2.0.

SoundEdit 16 doesn't directly support audio CDs, unlike the sound-editing program Audioshop 2.0, from Opcode. True, you can open audio tracks with QuickTime 2.0 and convert them to audio-only QuickTime movies, which SoundEdit can recognize. Alternatively, you can set your CD-ROM player as your sound-in source; play an audio CD, using the AppleCD Audio Player; and record the audio, using SoundEdit. But direct support would be much more convenient.

Widely Resounding

Welcome additions to SoundEdit are its ability to open, convert, and save files in 11 formats, including Windows WAV; an expandable control panel with buttons for nine sound effects, including amplify, fade-in and -out, and equalize; and the ability to export spectrum data in tab-delimited format for analysis in a data-analysis or spreadsheet program. The new effects tools include Normalize, which amplifies sound to its maximum limit without distorting it; Delay, which repeats a selected sound once; Emphasize, which brings out high-frequency sounds from a noisy background; and Crop, which lets you select a portion of a sound's waveform and delete everything *except* the section you've selected.

With all these new features, you might expect SoundEdit 16 to be slower than SoundEdit Pro, but we found it faster — and even more stable. And the next version of SoundEdit will be Power Mac-native, letting you apply sound effects even faster. If you ever have to create or edit sounds, you won't do better than using SoundEdit 16. / Ken Gruberman

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SoundEdit 16 1.0.1

Rating: ♦♦♦½

Price: $379 (list).

Company: Macromedia, San Francisco, CA; 800-288-4797 or 415-252-2000.

Pros: Plays and edits 16-bit sound. Supports QuickTime and multiple file formats. More sound effects than previous version.

Cons: Does not directly support audio-CD files.

Reader Service: Circle #407.

Alias Sketch! 2.0 / New Illustrator-style tools make 3-D modeling easier.

IMPROVED TOOLS and a better interface that includes new floating palettes, interactive dialog boxes, and lighting previews make the latest version of Alias Sketch! almost as easy to use as Adobe Illustrator. New drawing and modeling tools give you the ability to create just about any surface in

Convenient new floating palettes containing commonly used commands make the new version of Alias Sketch! easier to use.

3-D. And running native on a Power Mac, Sketch! renders the 3-D models you create almost five times as fast as the 680x0 version running on a Quadra 950.

3-D Illustrator

Replacing the previous version's awkward Curve-o-matic tool, Sketch! 2.0's pen tool, which you use to draw Bézier curves, functions just like that in Illustrator. You can even create 3-D Bézier curves by moving the pen tool up or down the z-axis. These curves can act as holes that will appear when you render your image, even though they don't trim (cut actual holes into) the surface.

Sketch! has one of the nicest skinning implementations we've seen. With the loft (skinning) tool, you can create curved or straight connections among a series of ribs, such as a barrel around staves or a ridged and curved bottle.

The new scissors tool can separate surfaces, letting you apply different textures to each surface. Sketch!'s extrusion tool can pull a shape along a path you've set with the pen tool. In previous versions of Sketch!,

you had to create an extrusion path by pulling out your shape freehand.

New floating palettes containing frequently used commands, such as Snap to Grid, also make working with Sketch! easier, even though they tend to clutter small screens.

You can change settings for any of the 3-D tools (extrude, sweep, loft, and revolve) by double-clicking on the tool in the Toolbar palette, just as you do in Illustrator. For example, you can set the extrusion tool to always cap the ends of an extruded object.

Picking up an object and aligning it with another is difficult; however, the new alignment dialog box helps you get around the problem — it gives you several options for aligning selected objects to a live surface, including aligning to the center or to the side of the surface. The Resize dialog box gives you finer controls than the resize tool by letting you change the size of an object as a percentage or a multiple of its current size. Sadly, unlike most other 3-D packages, Sketch! doesn't have similar dialog boxes for letting you position or rotate objects with numerical precision.

Bright Lights

Good lighting is an important part of a renderer, and the ability to preview the results of different lighting can save hours of rendering time. Hidden in the Object Info palette, the new Light Settings dialog box gives

parameters for brightness, spotlight angling, color, decay, and drop-off. This dialog box has a unique preview window that shows how either one light or all lights, as well as the shadows they cast, have an effect on a scene. This preview alone will save you countless hours of tedious rendering and rerendering trying to get just the proper lighting.

The native Power Mac version of Sketch! thunders through the rendering process four to five times as fast as the 680x0 version on a Quadra 950. On a Power Mac, even print-resolution ray tracing takes less than two hours. You can also distribute rendering over a bank of Macs. If you're using Quadras, this offers significant speed gains, but if you do this with Power Macs, you don't see much speed improvement. Alias has promised a fix for this problem by the end of the year.

We have few things on our wish list for Sketch! We would like to be able to manipulate more than one isoparm at a time, so we could more easily create symmetrical effects. We would like to be able to control Bézier curves along several points, as with StrataVision 3d. And if Sketch! provided multiple texture maps and procedural surfaces, it would be easier to create the sort of rendering effects you can get with Ray Dream Designer or Specular's Infini-D.

The Bottom Line

Sketch!'s new tools and its interactive dialog boxes and previews as well as its speed on the Power Macintosh make it one of the front-runners in 3-D design. With its improved feature set and its ability to export images in a wide variety of formats, it's an excellent choice for still-image 3-D artists or animators who are looking for an intuitive modeler. / Sean J. Safreed

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Alias Sketch! 2.0

Rating: ♦♦♦♦

Price: $695 (list).

Pros: Powerful and easy-to-use skinning. Interactive lighting previews. New 2- and 3-D pen tool.

Cons: No numerically precise positioning or rotation of objects. No multiple-isoparm manipulation. Only single-texture maps.

Company: Alias Research, Toronto, ON, Canada; 800-447-2542 or 416-362-9181.

Reader Service: Circle #408.

FastPace Instant Contact / Just another PIM? Not quite.

ELBOWING ITS WAY into the crowded PIM arena, Foresight Technology's FastPace Instant Contact is a multiuser contact manager aimed at workgroups. FastPace is a nimble performer with a serviceable feature set, but the initial release is missing several handy tools that competing products provide.

Setting the Pace

A FastPace contacts database can hold as many as 50,000 records. Each record comes with the expected fields for notes, home and work addresses, and phone numbers (automatic phone dialing is supported) and includes 16 customizable fields. If you're using another contact manager and decide to switch to FastPace, intelligent file importing makes it easy to get your existing data into FastPace.

FastPace gives you lots of options for configuring the program to work the way you do. To categorize contacts, you can assign any number of tags to them. In addition, for any field, you can change the name, assign a pop-up list of common values, and specify the format.

The program also gives you plenty of tools for managing your contacts, including four types of searches (single-, multiple-, and complex-field and tag), highly configurable list views, automatic duplicate-file detection, and file-merge. If you're running System 7.5 or have the Macintosh Drag and Drop extension installed, you can copy contacts from one database to another simply by dragging and dropping.

FastPace's interface is logically organized and well designed. List and detail windows display button bars that give you handy access to commonly used commands. The windows also use organizer tabs, similar to those in Microsoft Word and Excel, that allow the program to group several related selections within a single window, minimizing the number of windows that appear on-screen. To help you learn the functions of buttons and tabs, the program displays helpful context-sensitive tips on the right side of the button bar.

For printing, FastPace supports all the common label, contact-list, and address-book formats. An integrated word processor provides mail-merge and template-based options.

Workgroups can share FastPace contact databases on AppleTalk networks — no server is required.

Missing Links

Two important features are missing from FastPace. There's no easy access to frequently used contact information such as what Now Contact's QuickContact or Dynodex's DynoFind provides. And links to calendar programs are also absent. According to the company, the latter will be available in the version 1.1 upgrade, which should be available by the time you read this.

Another disappointment is the manual, which comes with a sparse index and a format better suited to a tutorial than to a helpful reference guide.

FastPace requires a Mac with at least 4 MB of RAM, running System 7.0 or later. A native Power Mac version ships in the box.

The Bottom Line

FastPace Instant Contact is a well-designed contact manager with a strong feature set and peppy searching and sorting. But considering its lack of a menu-bar icon for fast access to contacts and the absence of links to calendar programs, we were hard-pressed to find a compelling reason to recommend it over more-established contact managers such as Now Contact or Touch-Base Pro. / Jeffrey Sullivan

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FastPace Instant Contact 1.0

Rating: ♦♦♦½

Price: $79.95 (list).

Pros: Flexible, customizable fields. Fast. Multiuser capabilities. Built-in word processor.

Cons: No links to calendar programs. Lacks menu-bar icon for fast access to contacts. Poorly indexed manual.

Company: Foresight Technology, Fort Worth, TX; 800-701-9393 or 817-731-4444.

Reader Service: Circle #409.

Digital Chisel / Pierian Spring's educational-authoring tool passes the test.

ARE YOU TOO BUSY TO MASTER the ins and outs of a sophisticated multimedia authoring tool? Pierian Spring Software may have just the product for you, especially if you're an educator.

Its program Digital Chisel carves out new territory in the field of multimedia authoring, with sophisticated tools that are surprisingly simple to learn and use. No scripting is required, and special features enable you to create interactive lessons and exams, making Digital Chisel an easy and ideal tool for teachers and training professionals alike.

Media Maven

Digital Chisel lives up to its multimedia billing — it supports just about any type of media you can think of. The program comes with a paint and a draw module, tools for both path- and frame-based animation, and support for QuickTime movies and for sound (audio CD, record and play, and text to speech). You can even use it to control videodisc players.

The program's real strength lies in the ease with which you are able to combine various multimedia elements into a presentation (a presentation is called a *project* in Digital Chisel-speak). Every project comprises a series of screens that you create. When users run a completed project, the program displays the screens in the order you have specified — you can either set the screens to play automatically, with a specified time interval between the screens, or users can select the screens that they want to view. In order to enhance your projects, Digital Chisel allows you to add transition effects, such as wipes and fades, between screens.

For your interactive projects, any on-screen object can serve as a button that triggers one or more linked events when users click on it. For instance, if they click on a picture of an animal, they first hear the animal's sound and then view a separate text window that describes the animal's habitat. If they click on a word in the text window, they will get a definition of the word. You

can also link events to screens; this means that when a user calls up a screen, it triggers an event. Although you are able to set up similar interactive projects with Hyper-Card, Digital Chisel simplifies the process considerably by employing pop-up dialog boxes and menus rather than a scripting language.

Pop Quiz

What makes Digital Chisel especially appealing to educators is its ability to create interactive examinations. The program provides templates for true/false, multiple-choice, fill-in-the-blank, and matching-item questions. In addition, you can add sounds that indicate right or wrong answers, and you can even choose to program the exam to branch to a tutorial screen whenever a student supplies an incorrect answer.

After a student has completed an exam, Digital Chisel records the test results in its built-in database. Unfortunately, with the current version, you are able to view only one student record at a time — there's no way to combine all the test results into a class list, not even via a text file exported to another database program. The company plans to address this shortcoming in the next release.

Digital Chisel is one of the simplest-to-use programs we have encountered for

combining sound, QuickTime movies, and other elements into interactive projects. The hard part for most users will be creating their sound and movie files from scratch. Digital Chisel helps by providing a CD-ROM chock-full of sounds, pictures, and movies that are organized into library files. You simply drag elements from a library and drop them into your project screens.

Basic Tooling

Although Digital Chisel is hardly what you would call a slouch in the features department, you shouldn't expect its tools to be on the same level as those of advanced authoring programs such as Authorware Professional and CourseBuilder. Compared to Digital Chisel, each of these programs offers more-powerful animation capabilities, more-sophisticated tools for tracking student performance, and more-robust features for creating projects with conditional pathways. However, Authorware Professional and CourseBuilder are also considerably more difficult to master, and they cost hundreds of dollars more than Digital Chisel.

Overall, we were impressed with Digital Chisel's design and ease of use; nevertheless, we would like to see improvement in some areas. The program isn't always as flexible as it should be — for instance, when we were designing projects, we discovered that we had to constantly shift between the browse tool and the pointer tool, an annoying and inconvenient method. Similarly, dragging multiple objects from libraries to screens was tedious, because we
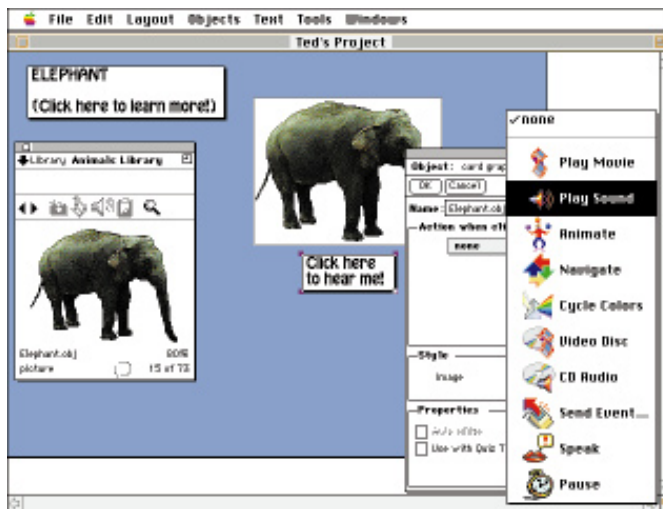
Its simple-to-use interface makes Digital Chisel a good choice if you're not up to the demands of a more sophisticated multimedia authoring tool.
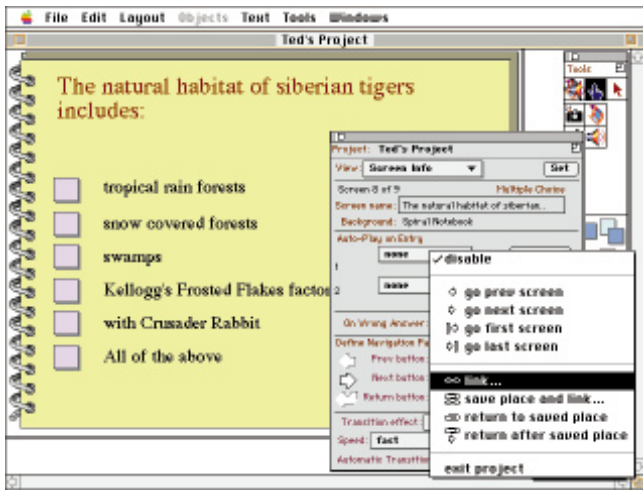
Interactive exams are easy to create with Digital Chisel.

couldn't view the scrolling library list and an object preview simultaneously — we had to select a name from the list, preview the object in another window, drag the object to a screen, and then start scrolling from the top of the list again to find another object.

We also encountered a bug in Digital Chisel. When we created new projects, the program would sometimes quit unexpectedly. Pierian Spring Software was unable to identify the cause of this problem, but we suspect that there is an extension conflict.

To achieve optimal performance when running Digital Chisel, you will need to use a 68040 Macintosh such as an LC 475 or a Quadra 630 and a minimum of 8 MB of RAM. For distribution of your projects, the program comes bundled with a royalty-free run-time player.

The Bottom Line

Digital Chisel gets high marks as a tool for creating a variety of interactive presentations. The program combines an easy-to-use interface with surprisingly powerful authoring tools — all at an affordable price. Its templates for creating interactive exams make Digital Chisel an especially attractive choice for educators, although the program's built-in database for recording exam results requires some improvement, especially in the area of report generation. Nonetheless, if you're a teacher who has been thinking about taking the plunge into multimedia authoring, Digital Chisel may be the program that finally gets you in the water. / Ted Landau

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Digital Chisel 1.2

Rating: ♦♦♦♦

Price: Single copy, $159.95; 5-user pack, $399.95; site license, $995 (list).

Pros: Simple to learn and use. Interactive exam templates.

Cons: Some tools inconvenient to use.

Company: Pierian Spring Software, Portland, OR 97201; 800-472-8578 or 503-222-2044.

Reader Service: Circle #410.

OmniPage Professional 5.0 / Powerful and faster, Caere's OCR stalwart scores high on accuracy.

PLAYING CATCH-UP with the competition, the latest release of OmniPage Professional features a much improved interface that makes it easier to use than earlier versions. And even with new features designed to improve accuracy, the program is faster than before. It also runs native on the Power Mac.

Click and Read

OmniPage Professional's new interface lacks the elegance of TypeReader's, but it's a major improvement over the previous version's. A new icon-based tool bar gives you fast access to all of OmniPage Professional's settings and processing options. Particularly convenient, the large Auto button lets you scan a page, automatically zone text blocks, and recognize a page with one mouse click. If you prefer to do your scanning, zoning, and recognizing separately, three other large buttons let you perform the functions one at a time.

Underneath the revamped design, OmniPage Professional — always a top performer in its ability to accurately turn scanned type into editable text — has a few new additions that should improve its accuracy even more. The new 3D OCR technology, unique to this program, recognizes gray parts of images and type, effectively sharpening the ability to recognize poor-quality pages such as faxes. AnyPage is Caere's version of Hewlett-Packard's AccuPage technology; both adjust contrast for OCR on every region of a page and are useful for scanning text that's on shaded or colored backgrounds. AnyPage works with a wide variety of scanners — if you have a gray-scale Hewlett-Packard scanner, you can use both AccuPage and AnyPage. Unfortunately, if you choose to do so, you have to switch between two Chooser drivers, one for AccuPage and one for AnyPage. OmniPage Professional also has a Compound Neural System feature, which is supposed to improve recognition of distorted or broken letters.

OmniPage Professional 5.0 has several features that are particularly useful for high-end work. You can automatically process a multipage document fed through your scanner with an automatic document
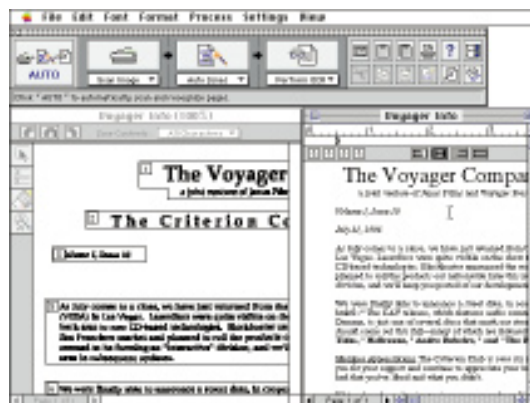
A new icon tool bar lets you scan, zone, and recognize a page with just the click of a mouse in OmniPage Professional 5.0, but you still can't retain the format of the original page in the Mac version.

feeder. OmniPage Professional can scan double-sided pages — that is, one side, such as the odd pages, first and then the other side, such as the even pages — and run the recognized text together correctly. You can also defer recognition of a scanned file or a batch of scanned files. You can save a template with designated zones for text and graphics, a handy feature if you regularly need to scan a standard form. Best of all, you can train the program by verifying letters it recognizes and specifying the correct letter for incorrectly recognized characters. You can then save the training files so that OmniPage Professional will more accurately recognize characters on poor-quality pages. OmniPage Professional can scan both text and graphics during the same pass and, of course, still has a superior text editor for cleaning up recognized pages before you save them in a word-processing format.

Caere's Image Assistant, previously a separate product, allows you to edit 24-bit-color images and replaces the old gray-scale

Power Mac OCR

A typist can't retype a business letter in a minute, but running native on a Power Mac, OmniPage Professional 5.0 can — and accurately at that. In all cases, 3D OCR technology was used.

	Business Letter	Fax Document	Newspaper Article
	SLOWER →	SLOWER →	SLOWER →
Power Mac 8100	70.8	111.4	77.9
Quadra 840av	126.2	227.0	127.4
	0 50 100 150	0 100 200 300	0 100 200
	TIME IN SECONDS	TIME IN SECONDS	TIME IN SECONDS
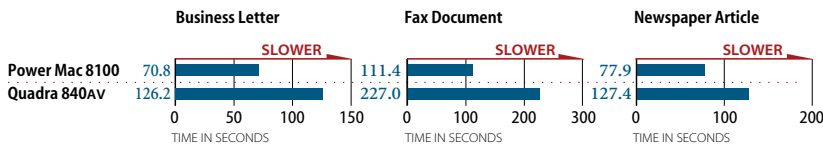
Graphic Editor in version 2.0. Although it has a more sophisticated palette of tools than Graphic Editor, Image Assistant is not as flexible or powerful as Photoshop.

Speed Reader

We tested OmniPage Professional with a variety of common document types: a business letter printed on cotton stock, a glossy magazine page, a poor-quality fax, and a newspaper article. When it came to accuracy, OmniPage Professional did quite well, correctly recognizing more than 95 percent of the characters in almost all the tests. However, even new technologies such as 3D OCR and Compound Neural System improved accuracy only very slightly.

Our biggest surprise during testing was that the 3D OCR technology, which we expected would slow down the recognition process, was faster in recognition than OmniPage without 3D OCR. On the Power Mac 8100, OmniPage Professional recognized characters up to twice as fast as on a Quadra 840av.

OmniPage Professional still isn't as flexible as its competitors. You cannot, for instance, scan multiple pages, recognize them, and then — once you've tweaked OmniPage Professional's settings for better accuracy — return to selected pages, have OmniPage Professional recognize them again, and replace them in the final text document without quitting the session.

OmniPage Professional's weakest area is page-layout retention. The program was unable to retain some basic page-layout formatting, such as the relative position of paragraphs on a page; in contrast, the $99 Xerox Desktop Document Systems' Text-Bridge (see review, September '94, page 44) managed to retain page-layout formatting. The Windows version of OmniPage Professional has Caere's True Page technology,

a scheme that lets you retain and edit the contents and layout of a page, but when it came to including the technology in the Mac 5.0 version, a Caere representative said that the company had to choose, given its resources, between making the product Power Mac-native or providing True Page. Caere says True Page will be incorporated into the Mac version in a future update.

The Bottom Line

Caere has done a fine job with OmniPage Professional 5.0, adding powerful features that make it the top program for high-end users. The templates for zoning and the new tool bar were instant hits with us, although we were disappointed about the delay in page-layout format retention. The program also has some high-end features few of its competitors have, such as the built-in graphics editor and the ability to save training files. However, if you have only modest OCR needs, there's no reason to shell out the extra cash when you can get one of Caere's other OCR programs, OmniPage 5.0, which doesn't have the 3D OCR technology or zone templates, for $495, or TextBridge for $99. / Gregory Wasson

OmniPage Professional 5.0

Rating: ♦♦♦♦

Price: $695; upgrade from version 2.0, $129 (list).

Company: Caere, Los Gatos, CA; 800-535-7226 or 408-395-7000.

Pros: Useful, well-designed tool bar. New technologies for recognizing poor-quality text. Many high-end features such as zone templates, trainability, and editor for 24-bit-color graphics.

Cons: No page-layout retention. Less flexible than competitors in handling changes during scanning or recognition process.

Reader Service: Circle #411.

KPT Bryce / 3-D world building made easy

ALL YOU HAVE to do is choose your favorite combination of sky, ground, and mountains to create exquisite natural and supernatural landscapes in KPT Bryce, an easy-to-use terrain-generation tool. With an interface long on high-quality pictures and short on traditional text-and-button layouts, KPT Bryce is a lot like Kai's Power Tools, another HSC Software product (see review, August '94, page 54). Both programs take some getting used to, but once you're up to speed, they're a joy to work with.
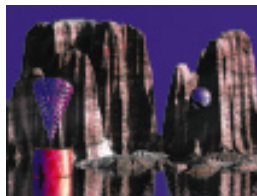
A New Horizon. Starting from either a preset landscape or a blank screen, you add typical landscape elements to create islands, mountains, and chasms. You can create terrains or import any PICT file and use its brightness as elevation data. You can also add less natural geometric elements such as spheres, pyramids, squares, and infinite planes. Once you've created your terrain, you can smooth, sharpen, or randomize it; merge it with another PICT file; apply filters to it; or even erode it according to realistic water-flow algorithms.

Once you start digging into KPT Bryce's fertile soil, you'll be impressed with the program's finesse. For instance, the textures you apply to scene elements are more sophisticated than those of traditional 3-D texture maps, responding to changes in the elements' orientation, slope, and elevation.

Slow but Superb. KPT Bryce's ray tracing trades speed for quality; a complicated scene can take several hours to render. A native Power Mac version, which will cut down rendering time, should be available by the time you read this.

We were disappointed that KPT Bryce is strictly still-life (a version with animation capabilities is being planned). The program also has no trees, which might not be important to you, except that it can't import or export DXF files.

If you yearn to create your own 3-D landscapes, you can create impressive computer-generated still-life landscapes with KPT Bryce, whether or not you're artistically gifted. / Jeffrey Sullivan

KPT Bryce 1.0 ♦♦♦♦ / **Price:** $199 (list). **Company:** HSC Software, Carpenteria, CA; 805-566-6200. **Reader Service:** Circle #412.
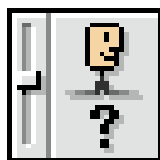
Nok Nok 2.0 / Security and speed in a file-sharing utility

IF SPEED AND SECURITY concerns have you shying away from file sharing, then look no further than Nok Nok 2.0, an ingenious utility that gives you additional control over the way file sharing works.

Monitor Your Mac. Nok Nok's main control panel lets you monitor who is logging on to your machine, set a maximum connect time for registered users and guests, and even maintain a log of your machine's file-sharing activity. Perhaps the most welcome security feature is the ability to display the names of the users or machines that log on to your Mac — even if they sign on as guests.

Accelerated Connections. Normally, your Mac allots only about 50 percent of its processor power to file sharing, resulting in rather poky network performance. With Nok Nok 2.0, you can make your Mac devote as much as 100 percent of its processing to file sharing, effectively doubling the data-transfer rate. Since Nok Nok has separate settings for the owner and for other users, you can get as much speed out of your Mac as possible when accessing it from a remote location while allowing guests as little as 10 percent total of your Mac's processing power, so they won't slow down your Mac while you're using it.

Bundled with Nok Nok 2.0 is the utility Lookout!, which allows you to see what version of AppleShare is running on the various machines on a network and whether they accept guests. However, Lookout! has trouble if your data-transfer rate with AppleTalk is too slow (for instance, if you have a heavy data load on your network) and will disable itself. The AG Group plans to correct this problem in Lookout! 2.0, due by March. / Christopher Karas

Nok Nok 2.0 ♦♦♦ / **Price:** $50 (list). **Company:** The AG Group, Walnut Creek, CA; 800-466-2447 or 510-937-7900. **Reader Service:** Circle #413.

PageTools / Additions on a tool bar

FOR THOSE WHO HAVE TO hunt for commands in Aldus PageMaker or wish for easier ways to align text and graphics or zoom in, PageTools, a set of ten Additions for PageMaker 5.0, revamps PageMaker's interface and adds some useful automatization.

PageMaker Tool Bar. If you like the customizable tool bars in Microsoft Word, PageBar will be your favorite Addition in this set. Hundreds of PageMaker commands have iconic equivalents. You can remove the ones you never use and group together related or similar functions.

The nine other PageTools Additions, accessible either through the tool bar or on the Aldus Additions menu, simplify common desktop-publishing tasks. Among the most notable: PageRulers brings up floating rulers — horizontal and vertical — that you can move around to measure design elements. PageAlign aligns text blocks and graphics to page edges or other objects. You can remove all the guides on a page simultaneously, automatically place guides around a graphic, or duplicate guides throughout your "publication" with PageGuides. PageThumb shows each page in your publication as a thumbnail so you can make sure it's the page you want before you move to it. Along similar lines, PagePreview shows you thumbnail views of the first five pages of an unopened publication. PagePrinter indicates which pages have been edited since the last time you printed your publication and lets you check off which pages you want to print instead of making you enter page numbers.

You get down to details but still see your whole page with PageZoom, which lets you select and magnify a section of a page as much as 800 percent. PageColors finds and replaces colors throughout your publication.

Each of these Additions is worthwhile enough to be sold separately; priced reasonably as a set, they're valuable for any PageMaker 5.0 user. / Mitzi Waltz

PageTools ♦♦♦♦ / **Price:** $129 (list). **Company:** Extensis, Portland, OR; 800-796-9798 or 503-274-2020. **Reader Service:** Circle #414.

AirNote / Message central

USING A PAGER is a great way to get messages when you're on the road. However, although many pagers have alphanumeric capabilities, many people use them only to send and receive phone numbers, since finding the right software or contracting with an operator service for messaging can be every bit as complicated as setting up a network at your office. To remedy the confusion, the AirNote pager system has everything you need — a text pager, modem software, and free activation of PageNet network services and SkyTel operator services.

Using the AirNote paging system makes it easy to send and receive messages. By calling a toll-free number, you or your clients can speak to an operator and page people by name or PIN (personal identification number). The basic AirNote service, which costs $20 a month, includes free Internet access and a twice-a-day news service, which sends you news or business articles on your pager. You can also buy additional services, including United States and international coverage, a personal toll-

free number, and voice mail. Another toll-free number gives you 24-hour-a-day customer service, for checking your billing, recalling messages sent within the last 99

hours, and finding out whether an area code is within your paging area.

If you want to use your modem, you can send e-mail messages containing as many as 120 characters apiece to an AirNote pager. Each pager has an Internet address, such as your PIN@airnote.net. But you might prefer using the easy-to-use SendNote software, which has several features for efficient messaging. You can save PIN numbers and names into a SendNote database, so you don't have to remember your colleague's address each time you need to

send that person a message. You can also create a group of addresses and send a message to several pagers at once. And you can save messages into a pop-up menu. For instance, if meetings often change, you can save the message "Meeting changed to" into the pop-up menu, pull it down, and enter the new time and date before you send the message to a group.

One World, One Pager. If you have other types of pagers and are looking to increase your team's communications capability, you'll be disappointed that SendNote works only with the AirNote pager.

The AirNote system is fine if you are just starting out with pagers in your business or for personal use, since you can easily expand it. Unfortunately, unless you like having your software and services selected for you, the AirNote service can't give you the flexibility your business might need, particularly if you already use other pagers or services. / Loretta Beavers

AirNote ✦✦✦½ / **Price:** $349 (list). **Company:** Notable Technologies, Oakland, CA; 800-732-9900 or 510-208-4422. **Reader Service:** Circle #415.

StreetSmart / Stock trading the hard way

USING STREETSMART, all you need is a Mac and a modem to track your investments, get quotes, trade securities, and receive news stories and research from Dow Jones and Standard & Poor's. But there's a catch: You have to put up with StreetSmart's poorly designed interface.

StreetSmart, which includes a $25 commission rebate, one free hour each on the Dow Jones Market Monitor and Standard & Poor's MarketScope, and one free company report, is available exclusively through Charles Schwab. That means you have to have a Charles Schwab account for any on-line trading. (You can enter trades through other brokerages manually.)

Hunting for Symbols. When you access Schwab's mainframe computer, you have to look up the symbols for the securities you want to trade or get quotes for in the *S&P Stock Guide,* a 256-page newsprint booklet printed in minuscule type. Since the financial-planning program Wealth-Builder (see Quick Clicks, June '94, page 79) and America Online's stock-trading service each have a built-in database of securities symbols, we were baffled by StreetSmart's lack of one.

Furthermore, StreetSmart's interface seriously needs improvement. There are too many windows, each duplicating some data found in the others but none providing the whole story. For instance, the Positions Download and Transactions Download windows are both used to download data from Schwab's main computer and each displays security names, symbols, and the number

of shares. The Transactions Download window also displays purchase and commission data missing from the Positions Download window. Adding a single button to the Transactions Download window might have adapted it to serve both purposes.

The tool bar that indicates on-line access does not give you as much information as a good telecommunications program: For instance, when you are logging on to the Schwab mainframe, you get little more information than a blinking chevron symbol and a short message. And if you're unsuccessful in logging on, you have
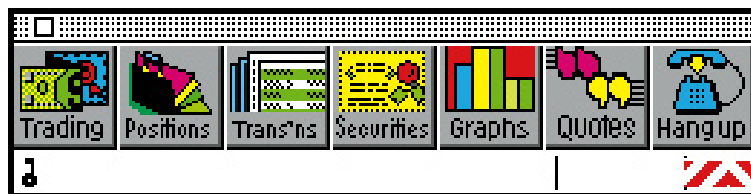
to close all translation windows before quitting the program — or you will get an error message. It's a pity that you'll need it, but on the positive side, Schwab's technical support is superb.

Although at only $59, StreetSmart may sound like a good deal, you pay a price in usability and practicality. You're better off getting quotes and news from an on-line service such as America Online or CompuServe, calling your broker for trades, and tracking your portfolio with WealthBuilder. / Darryl Lewis

StreetSmart 1.0 ✦✦ / **Price:** $59 (list). **Company:** Charles Schwab & Co., San Francisco, CA; 800-334-4455 or 415-627-7000. **Reader Service:** Circle #416.

Power Translator for Macintosh and Spanish Assistant / Lost in translation

THE MOST EFFICIENT way to translate foreign-language documents on the Mac, until recently, was to use the computer as a dictionary stand. Now, if you have a bit of Spanish knowledge and a lot of disk space, MicroTac's Spanish Assistant and Globalink's Power Translator allow you to produce draft-quality Spanish-to-English and English-to-Spanish translations of most business documents in less time than you would need with the pen, paper, and dictionary approach.

The two programs are similar in translation quality but vary in features. Power Translator has a unique voice-output feature that allows you to hear your Spanish-to-English translations in English as they happen. On the other hand, Spanish Assistant's grammar help is a plus and the program's interactive translating mode is more complete than Power Translator's. Spanish Assistant lets you go through all the possible meanings in the program's dictionary to select the translation that best fits the flavor of the sentence. Power Translator lets you stop translations to edit any awkward sentences, but it doesn't suggest alternative word meanings.

Big Brains. Each program needs a lot of hard-disk space. Power Translator takes up 17.5 MB on your hard disk; Spanish Assistant, 5 MB. Ironically, Spanish Assistant, which ideally needs 4 MB of RAM, is slower than Power Translator, which needs only 2 MB.

For the most complete translations with Spanish Assistant and Power Translator, you must add words and phrases to each program's dictionary. You need a working knowledge of the Spanish language and English grammar, since you have to type in the word and its translation, select its part of speech, and specify the grammatical rules that govern its use by deciphering and selecting codes for them. This process can be complicated at best and may be daunting to the grammar-shy.

If you prefer to edit already translated text instead of making changes in midtranslation, you'll find Power Translator's speed a definite advantage. Spanish Assistant's strength is in the interactive-translation mode and easily accessible grammar and inflection help, which enables those who are less proficient in Spanish to improve their translating skills.

Since a basic knowledge of Spanish grammar is essential to using either Power Translator or Spanish Assistant and because you must edit the translations to eliminate errors, these programs are not learning aids for foreign-language students. But if you have a general knowledge of Spanish and frequently need to produce comprehensible translations, Power Translator and Spanish Assistant will be valuable tools. / Marna Meltzer

Power Translator for Macintosh 2.0 ✦✦✦½ / **Price:** $299 (list). **Company:** Globalink, Fairfax, VA; 800-255-5660 or 703-273-5600. **Reader Service:** Circle #417.

Spanish Assistant 1.0 ✦✦✦½ / **Price:** $99.95 (list). **Company:** MicroTac Software, San Diego, CA; 800-366-4170 or 619-272-5700. **Reader Service:** Circle #418.

Si Señor
Yeah, Man

ILLUSTRATION / MORTENSBAK NYC
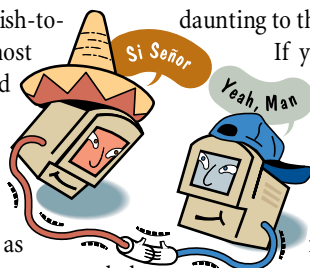
MicroSpeed Keyboard Deluxe Mac / ADB-port heaven

ARTISTS AND GAME players who find themselves precariously daisy-chaining their keyboard, mouse, graphics tablet, joystick, and copy-protection dongles from the Mac's single ADB port will appreciate the four ADB ports — one on each side and two along the back, three of which can accommodate daisy chains of two devices — on the MicroSpeed Keyboard Deluxe Mac. The only limitation with this 105-key extended keyboard is that the Macintosh's ADB port can't handle more than 500 milliamps of current. Even though the keyboard uses less than 100 milliamps and most other standard devices take considerably less, when you attach six devices to your keyboard, it's a good idea to check their power requirements.

Sticky, not Fried. The Keyboard Deluxe Mac has a membrane mat underneath the keys, which protects the contacts from liquid spills. We deliberately poured half a can of cola into the keyboard, and after we shook the liquid out, the keyboard suffered only from the sticky residue on the keys.

For those who need the extra ADB ports and the spill-resistance, the Keyboard Deluxe Mac is a nice alternative to the Apple Extended Keyboard at about the same price. / Patty Ames

MicroSpeed Keyboard Deluxe Mac ♦♦♦½ / **Price:** $125 (list). **Company:** MicroSpeed, Fremont, CA; 800-438-7733 or 510-490-1403. **Reader Service:** Circle #419.
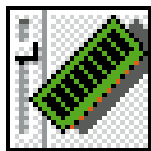
Maxima 3.0 / RAM-disk doubler

A RAM DISK lets you set aside a portion of your Mac's RAM to be used as a virtual hard disk with incredibly fast access speed. Apple embraced the RAM disk by including it in the Memory control panel of post-1992 Macs. But the RAM disk, like memory, is fleeting: Once you shut down your computer, your RAM disk disappears. Maxima lets you create a RAM disk on 68030 or more-powerful Macs (except LCs, LC IIs, and certain Performas — model 430 and below) with at least 8 MB of RAM. It backs up your RAM disk to your hard disk and now even compresses your RAM disk so it can be twice as large as the physical RAM it takes up. Although the compression does slightly increase the time it takes to access the RAM disk, accessing a RAM-doubled RAM disk is still faster than accessing a hard disk.

Maxed Out. Although we found Maxima stable in a standard system configuration, some cache cards and caching software are incompatible with the program. If you have a Mac SE/30, II, IIx, or IIcx, you need to use Connectix's MODE32 (included with Maxima) instead of Apple's 32-bit enabler.

Despite these drawbacks, Maxima is easy to install, saves you from having to re-create a RAM disk every time you boot up, and makes RAM disks a reality for those with older Macintoshes. / Christopher Breen

Maxima 3.0 ♦♦♦½ / **Price:** $99 (list). **Company:** Connectix, San Mateo, CA; 800-950-5880 or 415-571-5100. **Reader Service:** Circle #420.

Demo versions and QuickTime movies of selected programs mentioned here are available in the MacUser and ZiffNet/Mac areas on CompuServe and eWorld. See page 4 for instructions regarding on-line access.

Low-Cost Color Shootout

You've got a color monitor. You've got color software. Maybe it's time to add a color printer.

By Cheryl England

Buying a low-cost color printer is like adopting a puppy. The initial cost is low (a color printer can be had for less than $500, and a puppy costs the price of a license and a few shots), and both can be a delight to own. But if you aren't prepared to shell out for consumables (ink or ribbons and paper for the printer; Alpo, newspapers, and chew toys for Spot) and if you have no patience, then you may be better off without one.

That, at least, is the way we felt after spending many hours testing seven low-cost color printers. We experienced moments of sheer joy when bright, sharp images popped out of a printer with little or no effort on our part. But then again, we went through sheer agony when it took numerous calls to a company and a couple of hours of tinkering just to get usable output. And we always seemed to run out of ink or ribbons or paper at just the wrong instant.

All the printers we tested use QuickDraw, not PostScript, which means they rely on your Mac for their image-processing power — so their speed depends on your Mac's horsepower. Each of them connects to your Mac via a serial cable (a few can also connect directly to a LocalTalk network). Six of the printers — the Apple Color StyleWriter Pro and Color StyleWriter 2400; the Hewlett-Packard DeskWriter 320, DeskWriter 540, and DeskWriter 560C; and the Star Micronics SJ-144MC — have an average list price of around $500. The seventh, the Fargo Electronics Primera, has a list price of around $1,200 for its basic configuration.
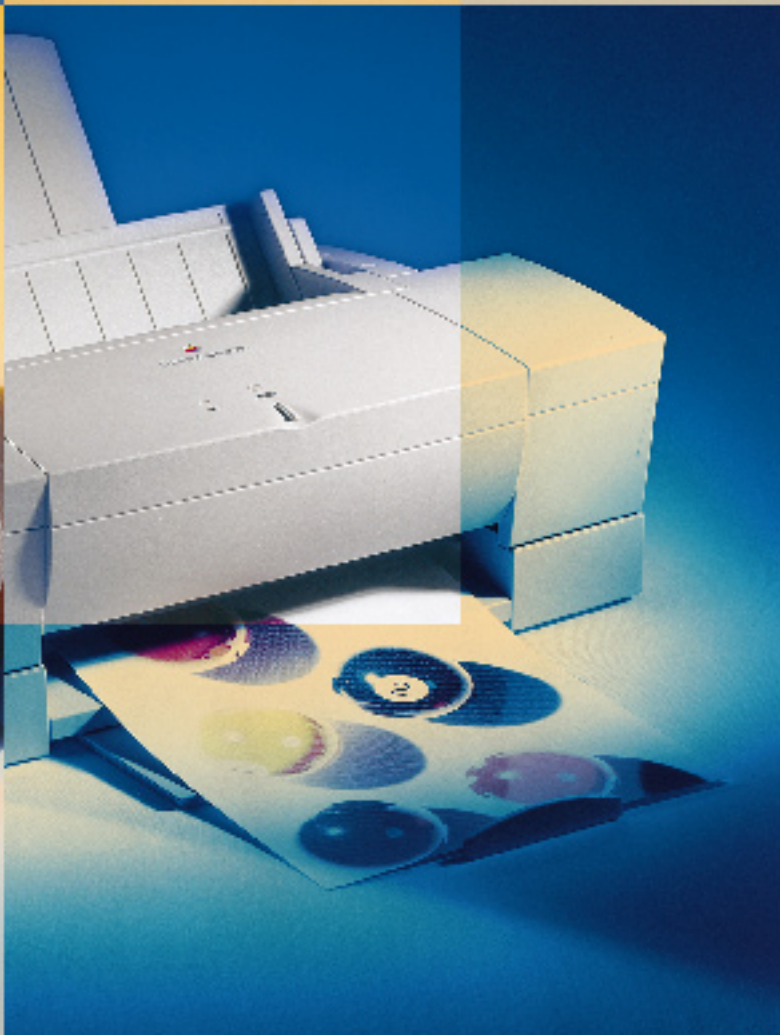
To find out where each of the printers shines — and where each fails — we used each one to create a multitude of documents ranging in complexity from simple text-only memos, to presentations printed on transparencies, to photographic images. In the end, we discovered that none of these printers is foolproof or fast and that their output quality ranges from pretty darn crummy to pretty darn impressive. But if you know what to expect and choose your printer accordingly — and give it the care and attention it needs — a low-cost color printer can be a welcome, well-behaved addition to your Mac setup, even if it never *does* fetch your newspaper for you.

Surveying the Pack

Five of the printers we tested — the two Apple StyleWriters and the three HP DeskWriters — use *inkjet* technology. Basically, they work by squirting microscopic drops of ink through tiny nozzles onto paper. Images printed with the liquid inks these printers use tend to smear when wet, although we found that Apple's water-resistant StyleWriter inks are a bit less smear-prone than those used in HP's DeskWriters.

The other two printers — the Star SJ-144MC and the Fargo Primera — use *thermal-wax* technology to place color on a page: A ribbon coated with cyan, magenta, yellow, and black pigments is heated by a tightly focused heat source that melts the ink and makes

it adhere to the page. The SJ-144MC uses proprietary ribbon cartridges that resemble those for typewriters (remember them?). The ribbons print across the page in strips half an inch wide. The Primera's ribbons are similar to those used in more-expensive thermal-wax printers. They consist of consecutive letter-paper-sized panels, one for each of the pigments used. The page is drawn into the printer once for each color used — three times if the ribbon contains cyan, magenta, and yellow panels; four times if the ribbon also contains black panels. A $250 upgrade kit from Fargo turns the Primera into a *dye-sublimation* printer, which places color on the page by vaporizing solid pigment, which then diffuses into the paper. The upgrade kit contains a dye-sub ribbon, replacement driver software, and special dye-sub "receiver" paper.

Overall, we were pleased with the sleek design and small footprint of these printers. The four largest — the Color StyleWriter Pro, the DeskWriter 540 and 560C, and the Primera — are about the size of an 8-pound bag of kibble. They come with fixed sheet feeders and output trays and, aesthetically, will please those users who find bulk a comforting indicator of sturdiness.

The other three — the Color StyleWriter 2400, the DeskWriter 320, and the SJ-144MC — are more diminutive: Each weighs less than 8 pounds, and even the largest, the Color StyleWriter 2400, would fit inside a good-sized shoe box. The Color StyleWriter 2400's output holder is a simple plastic strip you can slide under the printer when you don't need to use it. Although the holder may look flimsy compared to a conventional output tray, it works beautifully. The SJ-144MC, on the other hand, does not include any sort of output holder; printouts can easily fall or be blown off your desk.

The DeskWriter 320 is the only printer we reviewed that's truly portable. It weighs just 4.3 pounds without its optional sheet feeder, and it can run on a special Hewlett-Packard NiCd battery pack. (HP sells a rechargeable battery for $49 and a recharger for $99.) HP did an excellent job designing this printer's sheet feeder ($76 if you purchase it with the printer, $99 if you purchase it later): It attaches to the printer effortlessly, and the paper path is always aligned correctly. If you plan to print from a desktop Mac, do yourself a favor and buy the sheet feeder — the convenience of automatic paper feeding is well worth the price.

These low-cost color printers aren't really designed for heavy-duty network use, and we don't recommend them for high-volume use. Still, if you want to, you can set up the Apple Color StyleWriters and the HP DeskWriters as nodes on a LocalTalk network. To do so, the Color StyleWriter 2400 requires an optional LocalTalk module (about $100) and the DeskWriters each require a pair of LocalTalk connectors (about $60 for the pair). The Color StyleWriters also come with ColorShare, Apple software that allows someone on your LocalTalk or EtherTalk network to use a StyleWriter connected directly to your Mac.

Improving the Breed

One fact became immediately clear to us — the output quality of low-cost color printers has certainly advanced in the last few years. Overall, colors are brighter and problems with banding, paper jams, and poorly implemented dither patterns have nearly disappeared (for more on dithering, see the "Follow the Dots" sidebar). But note — even though all the printers can print in color on "plain"

The Bottom Line

MacUser ZD LABS ALL THESE PRINTERS are reasonably affordable to buy, but the cost of *using* them — in both supply costs and aggravation — differs widely. Our favorites offer ease of use, simple-to-set print options, clear error messages, and responsive customer service. Not incidentally, they also excel at producing high-quality output no matter whether you're printing text, transparencies, photographs, or colored line art.

⊕ = OUTSTANDING
● = ACCEPTABLE
⊖ = POOR

	Price/ Performance	Customer Service	Output Quality	Ease of Use
Apple Color StyleWriter 2400 🐭🐭🐭🐭	⊕	⊕	⊕	●

This diminutive sweetheart of a printer ($525 list, $505 street) produces rich, deep colors and crisp text. A joy to use, the StyleWriter 2400 offers fast print speeds, easy-to-understand settings, and a low cost per page for consumables.

	Price/ Performance	Customer Service	Output Quality	Ease of Use
HP DeskWriter 560C 🐭🐭🐭🐭	⊕	⊕	⊕	●

Bright, smooth colors with a hint of fluorescence characterize the output from this sturdy printer ($599 list, $565 street). HP's ColorSmart technology is a real boon — it makes producing high-quality output as foolproof as can be.

	Price/ Performance	Customer Service	Output Quality	Ease of Use
Apple Color StyleWriter Pro 🐭🐭🐭🐭	⊕	⊕	⊕	●
HP DeskWriter 320 🐭🐭🐭½	⊕	⊕	●	●
HP DeskWriter 540 🐭🐭🐭½	⊕	⊕	●	●
Fargo Primera (thermal-wax) 🐭🐭🐭	●	⊕	●	⊖
Fargo Primera (dye-sub) 🐭🐭🐭	●	⊕	●	⊖
Star SJ-144MC 🐭	⊖	⊖	●	⊖

Listing is alphabetical within groups of equal mouse ratings.

From Slow to Slower / color printers are no speed demons

MacUser ZD LABS **You'll love the output** you get from these color printers, but you won't love waiting for them. About the only document these printers were able to produce quickly in our tests was a monochrome text file. Fortunately, all the printers except the Star SJ-144MC support background printing. You still have to wait, however, while the printer spools the image to your hard disk.

For each test document, we timed how long it took to print at two levels of quality — best and normal. We didn't test any of the printers in draft mode, because this setting produced unacceptable output. Because the Fargo Primera has just two settings — High and Draft — we timed this printer at the High setting only.

Legend:
- Normal mode
- Best mode
- Transparency mode

Word (Black) We timed how long it took to print a one-page business letter created in Microsoft Word, including TrueType and Type 1 fonts.

Word (Color) We timed how long it took to print a one-page report that included black text, a color logo, and a color pie chart.

MacDraw We printed a one-page document that contained about half a page of simple graphics and about one-fifth text.

PowerPoint (Paper) We printed a two-page presentation that contained a gradated, color background; a pie chart; and text.

PowerPoint (Transparency) We printed a two-page presentation on transparencies to see the effect of a different medium on printing speed.

Printer	Word (Black)	Word (Color)	MacDraw	PowerPoint (Paper)	PowerPoint (Transparency)
Apple Color StyleWriter Pro	0:35 / 1:40	2:08 / 4:04	3:07 / 4:30	6:37 / 10:36	10:34
HP DeskWriter 540	0:37 / 0:39	3:15 / 5:05	3:12 / 4:59	7:30 / 15:01	20:58
Fargo Primera (thermal-wax)	1:12	3:48	4:18	8:41	8:46
✓ **Apple** Color StyleWriter 2400	0:37 / 2:02	2:14 / 7:04	3:04 / 7:41	10:01 / 16:49	16:49
Star SJ-144MC	0:47 / 0:57	4:41 / 4:22	5:36 / 5:05	14:22 / 18:52	15:45
✓ **HP** DeskWriter 560C	0:29 / 1:51	4:01 / 6:49	5:07 / 8:11	14:31 / 26:59	27:06
HP DeskWriter 320	0:37 / 1:44	4:47 / 8:41	4:43 / 8:35	13:16 / 21:49	21:53
Fargo Primera (dye-sub)	9:02	12:12	13:17	43:16	*

TIME IN MINUTES (scales: 0–9, 0–12, 0–13, 0–40, 0–30)

SLOWER →

✓ MacUser RECOMMENDS
* Can't print transparencies.

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bond or laser paper, you'll get top-quality output only if you use the best specially coated paper available for the printer. Plain-paper output from the inkjet printers is acceptable for many purposes, but without special paper, colors won't be as bright, text won't be as sharp, and blacks won't be as rich. Thermal-wax output on plain paper suffers from *dropouts,* areas in which the pigment doesn't stick to the uncoated page.

Our two most basic test images consisted of a monochrome letter and a report that contained black text; a colorful pie chart; and a red, white, and black company logo. For the black text, all the printers except the Primera produced sharp, unbroken letters when we printed the documents on the best available paper at the highest-quality setting. The text printed by the Primera in its thermal-wax configuration showed noticeable breaks and jagged edges — a result we anticipated, given the Primera's low resolution, 203 dpi. The three DeskWriters each have a resolution of 300 dpi (although if you're printing text only, the DeskWriters can print at 600 x 300 dpi). The SJ-144MC and the two StyleWriters each have a resolution of 360 dpi. In the Primera's dye-sub mode, text was smooth and unbroken but the edges weren't crisply defined. (The vapor diffusion that occurs in dye sublimation allows exceptional color blending but can result in blurriness.)

We noticed that the DeskWriter 320 and 540 and the dye-sub version of the Primera did not produce deep, rich blacks over large

areas. For instance, the black background of our company logo appeared slightly purple or green when printed by any of these three units. This oddity occurs because each of these three printers combines cyan, magenta, and yellow to create a *composite* black. The other printers use true-black inks or ribbon panels.

This observation points out the main difference between the DeskWriter 540 and its more expensive counterpart, the DeskWriter 560C. The DeskWriter 560C accommodates two ink cartridges, one for black ink and one containing cyan, magenta, and yellow inks; the DeskWriter 540 (like the DeskWriter 320) uses identical ink cartridges but only one at a time. Thus, the DeskWriter 560C can use true-black ink in color output, whereas the DeskWriter 540 must create composite black.

Printing the pie chart showed how well these printers handle large areas of basic, bright colors — red, yellow, blue, and green. The three DeskWriters produced extremely bright colors, whereas the StyleWriters, the Primera (in both thermal-wax and dye-sub mode), and the SJ-144MC produced deeper, richer colors. Only the DeskWriters and the Primera in dye-sub mode also produced extremely smooth colors. The other printers' output lacked consistency: We noticed dither patterns in the colors produced by the StyleWriters and the Primera in thermal-wax mode, and the SJ-144MC's colors were marred by distinct horizontal lines.

All the printers except the Primera in dye-sub mode can produce

Seeing Is Believing / output quality varies among low-cost printers

THE SUITABILITY OF OUTPUT from the printers we tested for this feature differs to some degree, depending on the type of image you plan to print with it. To use in sampling each printer's relative merits, we created the windsurfer image reproduced below. This challenging page includes a photographic image with a wide range of colors, black and colored text, blocks of solid color, and a gradated color background.

TEST IMAGES

COLOR RANGE

Vivid hues are the hallmark of the Hewlett-Packard DeskWriter series of printers. The vibrancy of the hot-pink sail and the surfer's helmet show that the HP inkjet printers can make bright, solid colors leap off the page. Skin tones and the surf are unnaturally "electric," however.

Subtle tones, in contrast, are the forte of the Apple Color StyleWriters: The surfer's skin and the water's surface are subdued and natural-looking, but the neon shades of the sail and board lack vividness.

PHOTOGRAPHY / SUE SNYDER   WINDSURFER / DAVID WHOLEY

CONTRASTING BLACKS
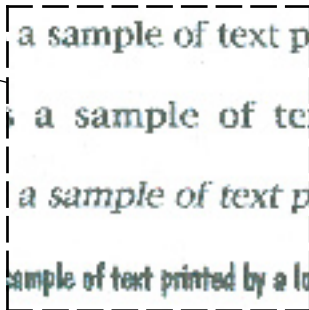
Process black, which is a mixture of cyan, magenta, and yellow inks, can have an unappealing greenish or purplish cast. Process black is used by the HP DeskWriter 540 (shown here) and 320; the Apple Color StyleWriter 2400 in color mode; and the Fargo and Star printers, when three-color ribbons are installed.
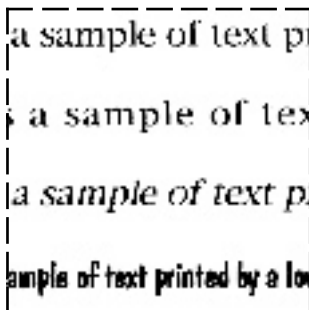
True-black ink is darker and appears more vivid than process black, especially in text. The Fargo and Star printers use true black when four-color ribbons are installed; the Apple Color StyleWriter Pro and the HP DeskWriter 560C use true-black inks as well.

IMAGE CONSISTENCY

Noticeable dots of ink, used by the HP and Apple inkjet printers and the Star and Fargo Primera in thermal-wax mode, create the illusion of many colors but can make photographic images look grainy; this is far less noticeable in printing solid, saturated colors.
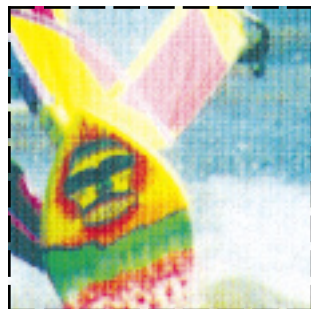
Continuous color, achieved as the page absorbs vaporized ink, is the greatest strength of the Fargo Primera in dye-sublimation mode; however, the same diffusion process has a tendency to blur the edges of type and fine-line illustrations.

transparencies. We included a color ramp in our test transparency, so we could find out how the printers handled blends. All the printers except the Star SJ-144MC performed acceptably on the transparency test; the horizontal lines it produced looked even worse when the output was projected from an overhead.

One of the toughest challenges we gave these printers was to print a photographic image of a windsurfer (see the "Seeing Is Believing" sidebar). Here, the DeskWriters' bright colors became a mixed blessing: A neon-pink sail looked wonderfully vibrant, but the surfer's skin tones looked excessively "hot" and the surf itself was a shade brighter than you'd expect to see in nature. The StyleWriters produced water and skin tones that were richer and more natural-looking, but the sail lost some of its vibrancy. The SJ-144MC's horizontal-line problem continued, whereas the Primera bounced between impressively smooth dye-sub printouts and rough-looking thermal-wax output.

Paper Training Required

Although these printers can produce high-quality output, coaxing it out is not always easy. During our testing, we were initially overwhelmed by the multitude of printing options each printer presented: We found ourselves fussing with different software settings, papers, and inks or cartridges in order to figure out what would give us the best printouts. And even though we spent a lot of time double-checking our various setups, we still managed to make several dumb errors (see the "10 Easy Ways to Screw Up" sidebar). Eventually, we grew comfortable with the Apple StyleWriters and the HP DeskWriters; the Star SJ-144C and the Fargo Primera were a

different story. To give you an idea of what we mean, here's a closer look at what we went through.

The StyleWriters and the DeskWriters give you lots of choices of paper types and of print-quality settings, but fortunately, they also give you lots of helpful guidance. In fact, although Apple's and HP's drivers offer "expert" adjustments for tweaking such factors as ink intensity and bleed control, we found that we got very good results simply by picking the settings for appropriate media (plain paper, glossy paper, transparency media, and so on) and choosing the "best" setting for print quality. When it came to choosing a color-dither setting, both Apple and HP kept it simple: With the Desk-Writers, choosing the ColorSmart option gave us outstanding results for all kinds of images. ColorSmart analyzes a page, looking for various data types — for example, text, simple geometric graphics, and complex bit-mapped graphics such as color photos — and it then applies appropriate dithers to each element of the page. Although the StyleWriters' driver isn't quite so sophisticated, its dither-choosing options are straightforward, and Apple's ColorSync color-matching system kept our output consistent with what we saw on our monitors.

We got truly abominable output from the Apple and HP printers only when we overrode the recommended settings and adjusted the color controls by hand. Once we decided to stop fiddling and stick with Apple's and HP's basic options, we found formulas that gave us consistent success. For us, using best mode with coated paper and choosing the scatter dither (with the StyleWriters) or ColorSmart (with the DeskWriters) yielded reliably good results. You should be able to figure out optimal settings for your documents as well.

Follow the Dots / understanding dithers

FIDDLE ABOUT. That's what you'll need to do while you learn how to get the best output from these printers. How good your final printout looks frequently depends on what type of *dither* you choose. Dithering refers to the arrangement of cyan, magenta, yellow, and (sometimes) black dots on a page to give the impression of a full spectrum of colors. The output quality of different image types — photographs, solid-color graphics, and line art, for example, can vary greatly with each dither.

Most printers offer at least two types of dithers — error-diffusion and pattern. You have to pick which one to use, and you must apply it to a whole page. HP's ColorSmart technology is intelligent enough to apply different dither patterns to different elements on the page, thereby making each element look its best.

Error-diffusion, or scatter, dithers are best suited to photographic images. As the name implies, this dither scatters dots irregularly, making edges and colors softer. These dithers typically take longer to process than pattern ones.

Pattern dithers are best suited to uniform colors, as in charts and graphs. As you might guess, pattern dithers place dots in an orderly arrangement on the page. Solid colors are emphasized, and edges are harder.

HP's ColorSmart technology analyzes each printed page, looking for different object types — for example, black text, simple graphics, and complex bit maps such as scanned photographs. It then intelligently applies appropriate dithers to each element.

10 Easy Ways to Screw Up / can you match the output with the mistakes?

IT'S BOUND TO HAPPEN — sooner or later, you're going to make a mistake. And you're going to get a pretty ugly printout because of it. It's not that we think you're stupid. (After all, we don't think *we're* stupid and we made a lot of mistakes during our testing.) It's just that these color printers aren't foolproof.

Here's a helpful low-tech hint — learn to use your printer, and then tape a checklist to it. In the meantime, you can learn from our mistakes. Here are some of our better boners:

1. Putting paper in the wrong way. All the special papers have a right side and a wrong side for printing. HP denotes the back of its paper with dim arrows, Apple's paper is whiter on the front, and Fargo's thermal-wax paper is a bit shinier on the front. None of these distinctions are particularly easy to see, especially in poor light.

2. Choosing the wrong ribbon. With the Fargo Primera, if you choose the wrong type of ribbon in software, you'll completely confuse the printer. The Star SJ-144MC has lights on the front control panel that tell you what type of ribbon is installed.

3. Spilling water on an inkjet printout. Water beads up and rolls off thermal-wax and dye-sub printouts, but it leaves smears and colorless blotches on inkjet output.

4. Ignoring HP's suggestion about aligning the print heads. If you don't align the print heads when you install a new cartridge, you may end up with misregistered colors.

5. Running out of ink. There's no way for a printer to detect when an ink cartridge is empty. If you spool a bunch of images to print and leave the printer unattended, you may come back to find that most of your printouts are missing one or more ink colors. (At least the Color Style-Writer Pro has clear ink cartridges that you can check.)

6. Forgetting to take the protective tape off an ink cartridge. You'll still get a printout, but you'll wonder why the colors are so light and why not all of them are being used.

7. Forgetting to have extra supplies on hand. If you're in the middle of a project, there's nothing more frustrating than running out of ink, ribbon, or paper — especially if local stores are out of stock and you've got to wait for delivery via the postal service.

8. Printing to the wrong printer. If you're on a network and normally use a laser printer, don't forget to change your printer selection in the Chooser.

9. Combining the wrong ribbon with the wrong paper. If you change the ribbon on the Primera but forget to change the paper, you'll end up with only the ghost of an image.

10. Printing a batch job that contains a monochrome image. The DeskWriter 320 and 540 can have either a black or a CMY cartridge installed but not both. HP's ColorSmart technology detects black-and-white-only images and, for these printers, displays a dialog box asking you if you're sure you want to print this image with a CMY cartridge. Unattended batch-print jobs sit idle, awaiting your return and response.

See if you can match these crummy printouts to the mistakes that caused them (answers below).

a

b

c

d

Answers: (a) 3, (b) 9, (c) 5, (d) 1.

Obedience Problems

Our pleasant experiences with the printers from Apple and HP were considerably different from those we had with the SJ-144MC and the Primera, however. It's bad enough that the setup options of the latter are bewildering, but even worse is that changing many of them seemed to have no effect at all. Neither printer consistently produced high-quality output.

The SJ-144MC's range of settings is beyond confusing: six dither patterns, three resolutions, four color depths (16 colors to millions), seven paper-feed adjustments, and two media options. More ludicrous is the apparent uselessness of many of the settings: We couldn't see any difference on our test output among the finest, finer, and fine dither patterns, nor could we detect a difference between printing at thousands of colors or millions of them.

But the Primera wins the award as the clunkiest. To print in the background with the Primera, you must first open a separate application called Backgrounder. Although this application can be handy for batch printing and although it gives you some nice options for handling print jobs (such as the ability to move jobs around within a queue), we found it very un-Mac-like to have to open an application to print in the background.

Even worse, we found it easy to confuse the Primera. For example, after we added a three-color thermal-wax ribbon, the printer defaulted to a four-color-ribbon setting in the active application. When we opened another application and tried to print, we ended up with an all-yellow image after failing to notice that the dialog box was still set for printing from a previously installed monochrome ribbon.

After considerable frustration (and lots of botched printouts), we eventually grew familiar with the quirks of the SJ-144MC and the Primera. Still, we were never able to consistently and easily achieve the high-quality results we could with the StyleWriters and the DeskWriters.

Greyhounds They Aren't

We might not complain so heartily about ease of use if the printers were faster. After all, if we could see our mistakes quickly — and fix them quickly — trial and error wouldn't be so painful. But sometimes the several rounds of printing it took to achieve perfect printouts took a couple of hours each.

These low-cost color printers are so slow that most vendors specify print speeds in minutes per page (mpp) rather than in the traditional measurement of pages per minute (ppm). So, for example, HP claims a maximum print speed of 5 mpp for color images printed in best mode on the DeskWriter 560C — that means a print speed of .2 ppm. Watch specifications closely, and if you ever see a low-cost color printer rated at 5 ppm, you've probably found a typographical error.

Our tests revealed that even print-speed claims of 5 mpp are optimistic. Only when printing a black-and-white text file could all the printers run that "fast," and even on this simple document, the extremely poky Primera dye-sub printer took 9 minutes. A few could stay under the 5-minute mark when printing a color text file with a simple MacDraw graphic. None, however, could print a full-page, full-color PowerPoint transparency in less than 10 minutes.

Fortunately, all the printers except the SJ-144MC support background printing. The printers first spool the image to your Mac's hard disk, a process that can take anywhere from a couple of seconds for a simple black-and-white text document to a couple of minutes for something as complex as our windsurfer image. All of the printers' software compresses the image data for temporary storage on a hard disk, so if you're printing two or three 10-MB images, you won't really need 20 or 30 MB of hard-disk space in order to print in the background.

Care and Feeding

If you believe that wasting money is an even greater sin than wasting time, pay close attention to the cost of the supplies required to run your printer. Whether you pay a few cents or a few dollars per page depends on the output quality you need and the types of images you print.

To get extremely high-quality printouts from inkjet printers, you must use expensive, $1-per-page glossy paper. But for many projects (such as informal reports), you can use a slightly lower grade of coated paper that costs only about 10 cents per page. And for some low-end chores, such as rough drafts or quick, colorful notes to friends, you can even get away with plain bond paper.

You'll spend the most money on ink cartridges. Most of the printers combine cyan, magenta, and yellow (CMY) inks in one cartridge; only the Color StyleWriter Pro uses individual cartridges for each ink color. Although you pay less up front for a cartridge that contains multiple ink colors, you must replace the cartridge as soon as any one color runs out. When printing multiple copies of our windsurfer image, for example, we ran out of yellow ink first. With the Color StyleWriter Pro, we replaced only the yellow cartridge (about $10); with the DeskWriters, we had to replace the entire $34.95 CMY cartridge. The Apple Color StyleWriters' print heads aren't replaced with each ink container, but they do have to be replaced periodically: the Color StyleWriter 2400 print head ($52.95, including a three-color ink container) should be replaced roughly every 2,000 pages; the Color StyleWriter Pro print head (about $150) should be replaced every 10,000 to 12,000 pages.

How long an ink cartridge lasts also depends on what types of images you print. In our tests, the DeskWriter 560C's CMY cartridge gave us 123 prints of our 5-x-7-inch windsurfer image. If we'd been printing a memo with a colorful border and logo or a graphic

figure 2

Color Printers Compared / finding the perfect match

Pick a feature — any feature — and you'll find a low-cost color printer that provides it. For some users, speed is a major factor; for others, it's getting the best output quality. Still others may just want a printer that's small enough to carry on the road.

Don't overlook the importance of consumables. Ink and ribbons can be costly, and if you want to produce high-quality output, you'll need to purchase special, high-priced paper. If, however, you can live with solid, if unspectacular, output quality (for example, if all you want to do is print colorful letters to friends or crank out children's artwork), then consider a printer that supports plain paper. Just be sure to keep extra supplies on hand: Many stores do not stock the right consumables, and most vendors charge extra for rush shipments.

	Apple Color StyleWriter Pro	✓ Apple Color StyleWriter 2400	Fargo Primera (thermal-wax)	Fargo Primera (dye-sub)	HP DeskWriter 320	HP DeskWriter 540	✓ HP DeskWriter 560C	Star SJ-144MC
List price	$629	$525	$1,194	$1,444	$428	$414	$599	$499
Street price	$610	$505	$885	$1,040	$390	$395	$565	$480
Technology	inkjet	inkjet	thermal-wax	dye-sub	inkjet	inkjet	inkjet	thermal-wax
Maximum color resolution	360 dpi	360 dpi	203 dpi	203 dpi	300 dpi	300 dpi	300 dpi	360 dpi
Engine speed	2 mpp	3 mpp	2.5 mpp	2.5 mpp	4 mpp	4 mpp	4 mpp	◊
Weight	11 lb	7.9 lb	15 lb	15 lb	4.3 lb*	11.6 lb	14.5 lb	5.5 lb
Cost of paper/number of sheets								
Best quality	$55/50	$55/50	$19.95/250	$279.95/100†	$59.95/50	$59.95/50	$59.95/50	NA
Normal quality	$14.95/200	$14.95/200	$14.95/250	NA	$20.95/200	$20.95/200	$20.95/200	$4.50/500
Transparency	$21.95/20	$21.95/20	$34.95/50	NA	$55.95/50	$55.95/50	$55.95/50	$19.95/20
Cost of ink or ribbon								
Black	$8.95	$7.95§	$39.95	NA	$31.95	$31.95	$31.95	$29.95
Color	$9.95 each	$21.95§	$45	$279.95†	$34.95	$34.95	$34.95	$22.50
Maximum paper capacity	100 sheets	100 sheets	50 sheets	30 sheets	NA**	100 sheets	100 sheets	30 sheets
Uses 3-color inks or ribbons			●	●	●	●		
Uses 4-color inks or ribbons	●	●	●				●	●
Supports background printing	●	●	●	●	●	●	●	●
TrueType fonts included	●	●			●			
Provides color-matching software	●	●	●	●	●	●	●	●
Output tray included	●	●	●	●	NA**	●	●	
Starter pack of paper included	●	●	●	●				●
Prints on plain paper	●	●			●	●	●	
Prints on legal-sized paper	●	●	●		●	●	●	●
Prints on envelopes	●	●			●	●	●	●††
Prints on transparencies	●	●	●		●	●	●	●
Prints on adhesive labels	●	●	●					●
Prints on iron-on transfers			●	●				●
Vendor offers discounts on bulk supplies			●	●				
Consumables sold by vendor			●	●	●		●	
Consumables sold by dealers	●	●	●	●	●	●	●	●
Consumables sold by office-supply stores	●	●			●	●	●	
Extended warranty	●	●	●	●	●	●	●	
On-line support	●	●	●	●	●	●	●	●
Toll-free tech support	●	●						
Warranty	1 year	1 year	1 year	1 year	1 year	3 years	3 years	2 years

✓ MacUser RECOMMENDS
*With sheet feeder, 7.5 lb.
†Price includes ribbon and paper for 100 prints.
§Price is for replacement ink tank. Cartridges (which also hold the print head) must be replaced after 2,000 pages and cost an additional $34.25 each.
◊Star doesn't supply mpp ratings for color output.
**Optional 60-page sheet feeder/output holder costs $76 if purchased with the printer or $99 separately.
††Hand-feed only.

created in Kid Pix, we'd have been able to get many more prints from the cartridge.

When you print monochrome files, you use ink only from the black cartridge in the StyleWriters and the DeskWriter 560C. The other DeskWriters, the 320 and the 540, use either a CMY or a black cartridge. If you have the CMY cartridge installed and ColorSmart detects a black-and-white-only page, it will ask you if you want to install the black cartridge before printing — a nice, money-saving touch.

Unlike inkjet printers, the Primera printer, in thermal-wax and dye-sub mode, has a steady cost per page. Each four-color print from the printer in thermal-wax mode costs 70 cents to $1; each from the printer in dye-sub mode costs $2.80. Although the printer isn't cost-effective in either mode for printing documents with only spots of color, using it can be reasonable if you need to print full-page, full-color images — for instance, large photographic images or transparencies that include solid color backgrounds. (Note, however, that the Fargo printer in dye-sub mode does not support transparencies.)

Sniffing Out Supplies

In case you're wondering how much the consumables for the SJ-144MC cost, well, we wish we could tell you. The required paper is ordinary laser bond, such as that made by Hammermill. You can find it in almost any office-supply store. But the ribbons are another story.

When we went shopping for supplies, we found inks and paper available for the StyleWriters and the DeskWriters at office-supply stores, computer superstores, and local dealers. In some cases, we had to make quite a few phone calls to find them, but at least they were available. In addition, you can order supplies for these printers and for the Primera directly from the vendors.

Star, however, doesn't sell any ribbons for its printer directly; you have to call a Star toll-free number, and an automated service provides names of dealers in your area that stock supplies for the printer as well as names of mail-order companies that can send you supplies. This system is time-consuming and unwieldy, but the real snag is that just one of the sources the Star hot line listed — a mail-order house called Midwest Micro — actually sold the ribbons. We asked for local-dealer referrals for two geographic areas — one on each coast — and found no dealers who had ever heard of the SJ-144MC. What's more, in our tests, we got only nine prints of the windsurfer image from the SJ-144MC's color ribbon.

Pick of the Litter

Over the years, vendors have made significant strides in bringing low-cost, good-quality color printing to the desktop. The limits of the technology are still apparent in some cases — for example, the inkjet printers still can't alert you when they are out of ink and the dye-sub printers still can't print on anything but special photographic paper. But the printers are no longer next to impossible to install, use, and maintain.

Apple's StyleWriters produce deep, rich, natural-looking colors, and Apple's software interface is the cleanest we've seen. Choosing between the Color StyleWriter Pro and the Color StyleWriter 2400 is really a matter of taste. The Color StyleWriter Pro uses separate ink cartridges for each color and black and includes a fixed output tray, but it can't connect to a network. The Color StyleWriter 2400, on the other hand, is — we almost hate to say it — cute. And for the practical among you, it also offers the advantage of a small footprint and the ability to connect directly to a LocalTalk network.

The DeskWriters produce extremely bright colors, and they're smart enough to adjust dithers and color matching. We got the brightest colors, richest blacks, and sharpest text from the DeskWriter 560C. But the DeskWriter 540 was no slouch either, and it costs less than the DeskWriter 560C. The DeskWriter 320 is on target for users who want true portability along with reliability and solid output quality.

If you mostly need full-page, full-color output such as transparencies for presentations, you're a candidate for buying a Fargo Primera and using it in thermal-wax mode. The cost per page for this type of printout is the same as with an inkjet printer, and you don't have to worry about estimating how many prints you can get from a ribbon. In addition, the Primera's software includes batch-printing options that can be handy for producing multiple sets of presentation transparencies.

Operating the Primera in dye-sub mode is slow and expensive, and its text output is unacceptably blurry, but for a sub-$1,000 printer, it *does* deliver surprisingly good quality for photographic images: Unlike high-end dye-sub printers, the Primera's colors consist of dots that can be discerned under magnification; however, to the unaided eye, the colors blend with admirable smoothness. Although it's nowhere near good enough for professional publishing or printing use, this printer could be a good option for Photo CD enthusiasts.

We found *no* reasons to purchase the Star SJ-144MC, however. Star representatives say the company is going through a restructuring and that improvements are under way, but for the time being, confusing software, lack of background printing, noticeable banding in areas of continuous color, and overpriced and hard-to-find supplies leave little to recommend the SJ-144MC.

We were glad to see that some of the printers really are suited to home users. We were also sad to see that it was printers based on newer technologies that failed to win our respect. Perhaps, over time, these printers too will find a place on our desks. 🖎

Cheryl England is a *MacUser* senior editor. Kristina De Nike, of ZD Labs, and Roman Loyola, of MacUser Labs, managed the testing for this report.

Personal Information Managers

Can't afford a personal secretary? One of these seven low-cost organizers can manage your appointments — and never calls in sick.

By Shelley Cryan

Electric Assistants

You're knee-deep in the quarterly budget, the phone won't stop ringing, and you've got a nagging feeling that you're supposed to meet someone for lunch — but you just can't remember who. Sound familiar? We all suffer from the effects of organizational entropy from time to time. But don't worry, your Mac could be just the thing to keep entropy at bay — your Mac and a PIM, that is.

A *PIM,* or personal information manager, can rescue your phone numbers, addresses, appointments, and to-do lists from cocktail-napkin oblivion and store them neatly in your Mac. Even better, good PIMs let you slice and dice this information in virtually any way you want. And if you own a PowerBook, you can take this personal database everywhere you go; in case you don't, most PIMs let you print your data in a variety of ways — including in standard Day-Timer-type formats — so you never have to be without your personal data.

Listening to PIM makers, you'd think there were only two types of people in the world: Those who use a PIM and those who should. In reality, many folks can, and do, get along just fine without one. If you use your Mac only occasionally, a PIM's scheduling features won't be of much use, and if you just need to store a simple holiday-card list, the HyperCard address stack will do just fine.

In our informal survey of people who do use a PIM, we found three types of users: The first are casual, relaxed folks who just want an electronic version of a Rolodex and don't really have much time or inclination to keep it updated. The second are busy types who want to maintain a list of contacts and a calendar and would like them as integrated — and as easy to use — as possible. The third are classic anal retentives who want to organize absolutely everything in a desperate attempt to make order from the chaos of life — these workaholics want all the above and the flexibility to modify their PIM to match their method of organization.

Our survey also revealed what we already knew in our hearts: Most people are lazy. Also, only a few need exceptionally powerful, highly configurable — and formidably

complex — personal information *and* organization systems. Because of this, we focused on PIMs that meet the needs of our first two groups of users. For information on super-PIMs, see the "High-End PIMs" sidebar.

Since the ideal PIM for the masses should include a range of capabilities at a low price, we further narrowed our focus to sub-$200 PIMs with integrated calendars, planners, and lists of contacts. This roundup included Ascend 3.0, from Franklin Quest; Claris Organizer 1.0; Full Contact 2.02, from FIT Software; Rae Assist 1.5.2; and Shortlist 1.0.1, from Brainchild. Also qualifying were DateBook & TouchBase Pro 4.0 Bundle, from Aldus, and Now Up-to-Date 2.1.1 & Now Contact 1.1, from Now Software, which use System 7's Apple events to share data. ProVue's Power Team and Portfolio's Day-to-Day were being revised when we were preparing our report, so we didn't include them.

Narrowing Your Choices

Before you decide which features can best help you conquer your innate laziness, take stock of any system limitations. For instance, if you haven't yet made the jump to System 7, you'll have to pass on all but Ascend, Rae Assist, and Shortlist. DateBook & TouchBase Pro can run under System 6, but their sharing capabilities require System 7.

Short on RAM? Most PIMs need just 1 MB or less, but DateBook & TouchBase Pro and Now Up-to-Date & Now Contact eat up 2 MB each. Rae Assist tops the list at 2.7 MB. Since many of these applications can take considerable time to open, especially if you have a large list of contacts or a full calendar, you may want to keep your PIM open all the time — but remember that a memory-hungry PIM may leave little space for other applications.

If you share information over a network, you're limited to Date-Book & TouchBase Pro and Now Up-to-Date & Now Contact. Expect Now Software to beef up Now Up-to-Date & Now Contact's group-scheduling and group-contact-list capabilities in version 3.0, which should be available by the time you read this. Neither package, however, currently offers group-scheduling features, such as the identification of schedule conflicts across a network.

Once you've narrowed the field of PIMs to those that meet your basic needs, it's time to look at specific features. The four key areas we considered are contact management, scheduling, task/project management, and ease of use and maintainability.

How important these features are to you depends on your situation. If your happy existence is threatened by an inability to remember whom you need to see and what their telephone numbers and addresses are, then examine a PIM's contact-management capabilities. If you constantly juggle meetings, you'll need a heavy-duty scheduler or calendar. If your life is filled with a series of deadlines and multistep projects, get a PIM with top-notch task- and project-management features. And no matter what your priorities are, make darned sure all these features — contact manager, scheduler, and task/project manager — are well linked so that your information is shared by the various components of the PIM, relieving you of the redundant, repetitive, reiterative burden of entering data over and over again.

Side o' Hot Links

Until recently, PIMs offered little more than electronic versions of a basic list of contacts and a calendar, and they didn't talk to each other. These days, linking is one of the hottest trends in the PIM arena — and one that makes PIMs worth another look if you've dismissed them previously. Linking lets you associate, or link, one piece of information, say an appointment with your accountant, with another piece of information already entered elsewhere, such as your accountant's name, address, and phone number. This way, you don't have to retype contact information in your appointment list; the pertinent information is no more than a mouse click away. This linking not only helps keep you organized but also makes PIM maintenance much less time-consuming.

Just as you can link contacts to appointments, you can also link them to notes, to-do items, and other contacts. Claris Organizer offers a particularly intuitive way of showing links — it displays the same icon, a paper clip, no matter which window is active. Click on the paper clip to see a list of the linked items, and select any item to jump to it. Full Contact has the most linking options, but all this flexibility can make it difficult to manage. Rae Assist provides powerful, intelligent linking tools — it often assists you by guessing what information you want to link.

Claris Organizer, DateBook & TouchBase Pro, Now Up-to-Date & Now Contact, and Rae Assist even let you link external documents to contacts or appointments, so you can attach, say, a profit-and-loss spreadsheet to a scheduled financial-review meeting. Select the attached document, and RAM permitting, the source application will launch and display it.

The Bottom Line

NO MORE EXCUSES: A good PIM will eliminate the last remaining when-I-get-around-to-it rationalizations you've been using to keep from getting organized. If you're like most people, a personal information manager will do wonders for your productivity, promptness, and peace of mind — if only to remind you to program the VCR to record your favorite show and set the timer on the Radar Range so the TV dinner's ready when you get home. Our top pick offers features that make getting organized — and staying organized — a breeze.

⊕ = OUTSTANDING
● = ACCEPTABLE
⊖ = POOR

	PRICE/PERFORMANCE	CUSTOMER SERVICE	EASE OF USE	FEATURES
🐭🐭🐭🐭 **Claris Organizer 1.0**	⊕	●	⊕	⊕
Simple, powerful, and inexpensive, Claris Organizer ($99 list, $50 street) is tough to beat. This easy-to-use program will have you organized in no time. It packs many sophisticated features into a blissfully small package, an impressive achievement for a new product.				
🐭🐭🐭½ DateBook & TouchBase Pro 4.0 Bundle	⊕	●	●	⊕
🐭🐭🐭½ Now Up-To-Date 2.1.1 & Now Contact 1.1	●	●	●	⊕
🐭🐭🐭½ Rae Assist 1.5.2	●	●	⊕	●
🐭🐭🐭 Full Contact 2.02	●	●	⊖	⊕
🐭🐭½ Ascend 3.0	⊖	●	⊕	⊖
🐭🐭½ Shortlist 1.0.1	⊖	●	⊖	⊖

Listing is alphabetical within groups of equal mouse ratings.

High-End PIMs / *when a database is more than just a database*

YOU CAN GET ONE HECK OF A PIM for around fifty bucks, so what could possess a PIM purchaser to invest upwards of $300? Power and flexibility. More-expensive PIMs aren't really geared to the average user; rather, they're for managers, salespeople, and serious neat freaks with money to spend, time to invest, and a burning desire to make order out of the chaos that they see nibbling at the edges of their lives.

ACT! 2.0 is an all-in-one PIM with a strong focus on communications. Its integrated e-mail works via PowerTalk. And ACT! can use FAXstf software (not included) to mail-merge faxes. ACT! was originally a Windows product, and the interface shows its roots. To its credit, however, this cross-platform PIM is a mighty attractive tool for many business environments.

Arrange 2.0 is exceptionally flexible, allowing you to configure your information in any way you see fit. Arrange treats each idea, person, appointment, or to-do item as a *note*, a data record that can be joined with other notes in any combination, mimicking the way the user thinks. Although complex, Arrange comes with some handy prebuilt templates, so it's ready to work right out of the box. It also has autodialing and data-entry-aid plug-ins and templates for printing to Avery labels.

CAT IV 1.0 aids businesses with heavy contact-management and office-automation needs. Ideal for use in the field, CAT IV allows mobile users to revise or add contact information and upload it to a central database via Apple Remote Access (ARA).

In a column alongside the contact names,

a check mark in the to-do box alerts the user to some action that must be taken pertaining to this contact. Double-click on the check mark to get to-do instructions — for example, doubling-clicking might take you to a letter that's formatted, merged with contact info, and ready to be printed for mailing to a customer.

SuperOffice 2.5 has a clean, intuitive interface that's easy for new users to navigate, but it's also powerful enough for more-sophisticated users. SuperOffice files are cross-platform and can be shared via ARA.

This PIM is distinctive in that it takes over your desktop. Buttons launch your word processing, spreadsheet, e-mail, on-line service, or other application you've designated. When you quit those applications, you're returned to SuperOffice. If you have a problem figuring out that difficult Mac interface or just like the good ol' look and feel of a dedicated system, this may just be the interface for you. / *Patty Ames*

Looks like a Windows application? There's a good reason: ACT! started there and is now available on the Mac as well. ACT! offers several customizable fields to help you sort complex contact information, but its main strength is in communications, supporting both Mac and Windows clients.
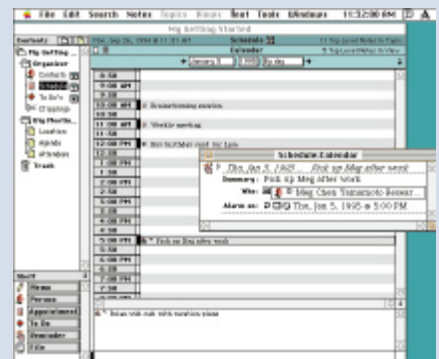
Arrange offers phenomenal flexibility: All data types are considered notes that can be linked and sorted in almost any way.

Managing Your Who Info

All the linking in the world won't help if your PIM's contact manager can't hold the kind of information you need to keep or if it's too hard to retrieve your data when you need it. All the PIMs we looked at let you store names, addresses, and phone numbers and use an entry window similar to a Rolodex card. Each piece of information, such as last name, home phone number, and ZIP code, is stored on a separate line, or *field*. The information becomes a database, which you can then search, sort, filter, and print.

Each PIM we reviewed has designated fields for entering basic personal information. Claris Organizer and Shortlist also provide handy fields for entering nicknames, prefixes (such as *Dr.* or *Ms.*), and suffixes (such as *Jr.* or *III*).

If a PIM doesn't contain a predefined field for entering the information you have, don't dismiss it. All except Ascend and Shortlist contain fields you can define yourself. Usually, customizable fields are straight data-entry fields, but Claris Organizer, DateBook & TouchBase Pro, and Full Contact also let you set up menus so you can enter frequently used information by simply selecting it from a list instead of entering it every time. DateBook & TouchBase Pro offers the most customizable fields, at 16.

One of the most useful contact-management features available in all PIMs is the ability to assign a category, or *tag* — such as *friend*, *business*, or *family* — to individual contacts. Tagging a contact

makes it easy to group similarly tagged contacts later. Surprisingly, the otherwise feature-rich DateBook & TouchBase Pro doesn't provide a predefined field specifically for tagging; you must use one of its customizable fields. All the PIMs except Shortlist allow you to define your own tag names.

Anyone who has contacts needs to enter company addresses and phone numbers. Most of the programs treat this information like every other piece of information: You enter it in fields in the contact-entry window. If you have 17 contacts at Acme Widget, you must type Acme's business address and main phone number 17 times or, at best, cut and paste it into each person's entry window. If Acme moves, you've got to update all 17 records.

Not so with Full Contact and Rae Assist — they store company information separately from the contact itself. This way, Acme Widget is stored only once. Everyone listed in your database who works at Acme Widget is linked to the company information, so when you pull up an employee's contact information, that person's company information is just a mouse click away. The benefit: You enter or edit the company information only once, making database maintenance easy.

Full Contact and Rae Assist extend the convenience of auto-completing fields to when you enter a new contact. If Full Contact recognizes the company name after you've typed just the first few letters, it can optionally fill in the rest of the information for you.

PIM Personalities / *a wide variety of interfaces to choose from*

UNLIKE WORD PROCESSORS or spreadsheet programs — where one application looks pretty much like another — each PIM has a personality all its own. Although all PIMs have a basic calendar view and a basic contact-list window, that's where the similarities end. Before deciding on a PIM, take a close look at its interface — after all, it's your personal information and it ought to be accessible in a way that matches your personality. And if your personality is one of chaos and laziness, forget a PIM and stick with plastering your monitor with Post-it notes.

Task management is the one area where **Ascend,** from Franklin Quest, truly shines. Icons that mark the status of tasks are borrowed from the popular Franklin Day Planner system and may make sense only to those who are familiar with that system.
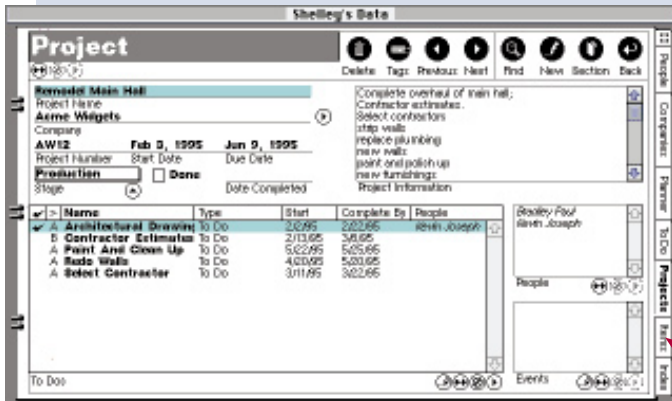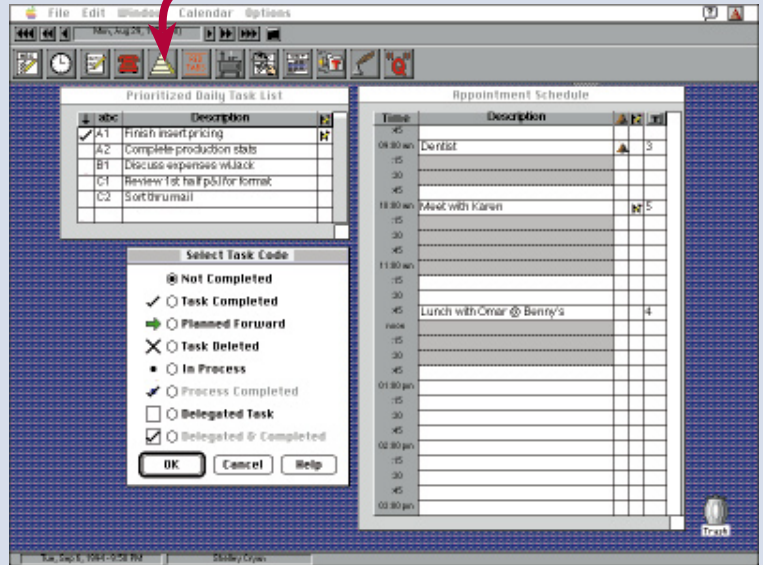
Rae Assist is one of several PIMs that conveniently offer a separate projects area. Rae Assist uses a binder metaphor; click on the tabs on the right to navigate to the major areas.
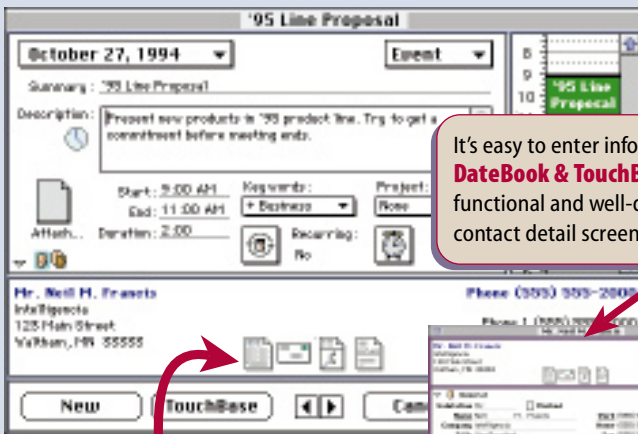
It's easy to enter information in **DateBook & TouchBase Pro's** functional and well-designed contact detail screen.

Note that files and calendar items can be linked to the contact areas for plenty of customized fields.
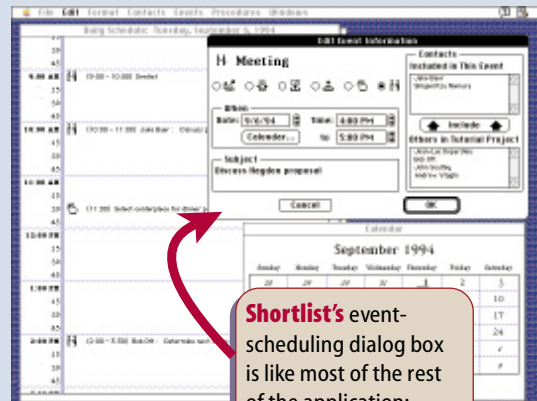
Shortlist's event-scheduling dialog box is like most of the rest of the application: dated and awkwardly structured.
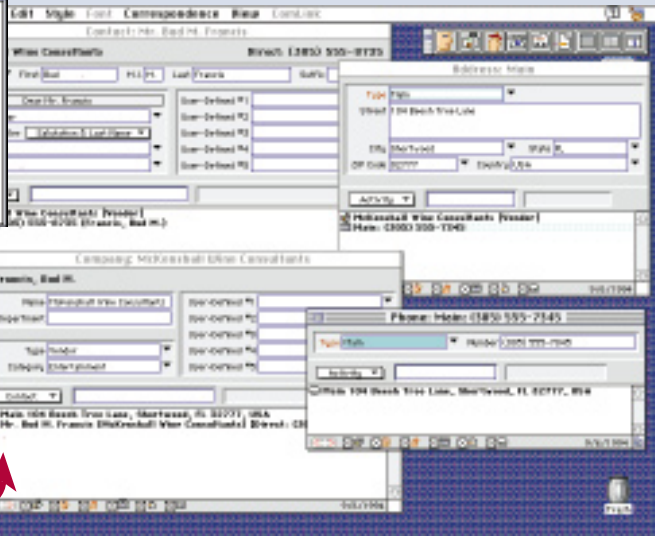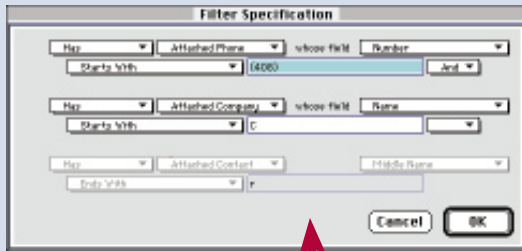
You can fine-tune data searches using FIT Software's **Full Contact,** whose hallmark is extreme flexibility. The program's flexibility, however, can at times make it overwhelmingly complex to use.
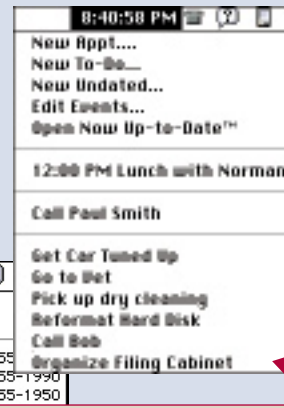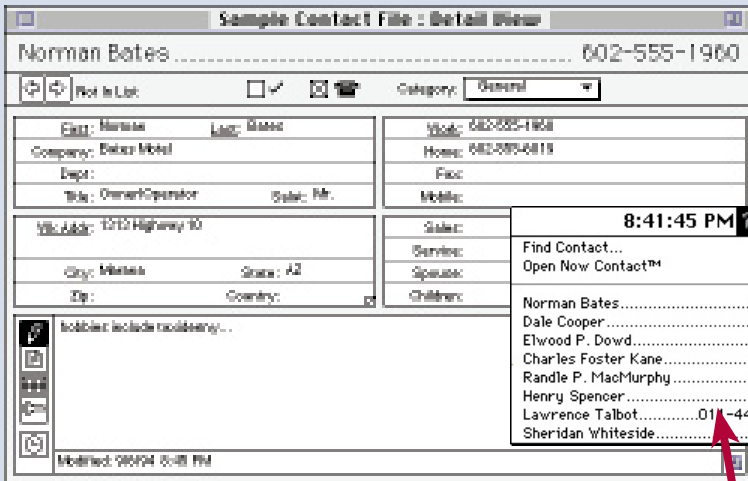
The **Now Up-to-Date & Now Contact** combination PIM conveniently offers access to some of its data even when the programs aren't running. Pull down either of the menus permanently located in the upper right corner of your screen to access frequently used data without launching the application.
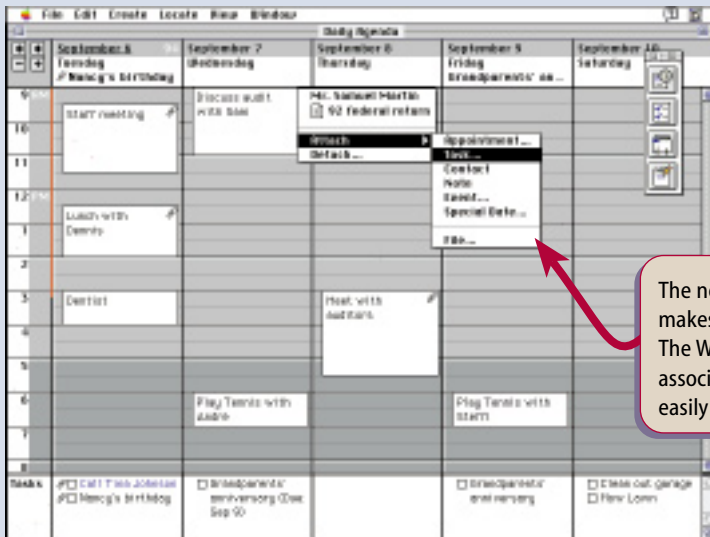
The new kid on the block, **Claris Organizer,** makes it easy to attach items to appointments. The Wednesday-morning meeting here has associated contact details and a related file, all easily accessible.

Rae Assist is only a bit less intelligent: You need to enter the company's full name and then move to the next field before it will search for the company information. Autocompletion features such as these also help make maintaining a PIM as hassle-free as possible.

In addition to storing personal data, PIMs are great for mass mailings. For instance, you can export a text file of names and addresses contained in a PIM to your favorite word processor for mail-merging. But for the ultimate in convenience, DateBook & TouchBase Pro, Full Contact, Now Up-to-Date & Now Contact, and Shortlist provide built-in word processors that are adequate for simple correspondence and have some mail-merge capabilities. You'll still want to hang on to your stand-alone word processor for documents with more-complex formatting and text-handling

figure 1

Features of PIMs / *linked PIMs under $200*

	Ascend 3.0	✓ Claris Organizer 1.0	DateBook & TouchBase Pro 4.0 Bundle	Full Contact 2.02	Now Up-to-Date 2.1.1 & Now Contact 1.1	Rae Assist 1.5.2	Shortlist 1.0.1
Requirements							
System software	6.0.5	7	7	7	7	6.0.7	6.0.7
Hard-disk space	2 MB	2 MB	4 MB	2 MB	2 MB	6 MB	1 MB
Suggested RAM	900K	1.2 MB	2 MB	1 MB	2 MB	2.7 MB	1 MB
Power Mac version		*	*	●	●		
External communication							
Imports text files	●	●	●	●	●	●	●
Exports text files	●	●	●	●	●	●	●
Network support			●		●		
Password protection	●			●		●	
Autodialer	●	●	●	●	●	●	●
Contact management							
Customizable field types		4	16	10	†	9	
Free-form general notes	●	●	●	●	●	●	●
Custom groupings/tags	●	●	●	●	●	●	
Word processor with mail-merge		§	●	●	●		●
Links external files to contact	●	●			●		
Scheduling							
Conflict display		●	●	●	●		●
Allows for conflicts	●	●	●	●	●	●	●
Recurring activities	●	●	●	●	●	●	
Links contacts to appointments		●	●	●	●	●	●
Multiday events	●	●	●	●	●		
Project/task management							
To-do lists	●	●	●	●	●	●	●
Alarms	●	●	●	●	●		
Separate project area			●			●	●
Links contacts to tasks		●	●	●	●	●	●
Links external files to items		●	●				
Billing time log							●
Interface							
Smart data entry		●	●	●	●	●	
Access without launching			●		●		
Output							
Prints in popular formats	●	●	●		●		
Envelope printing	●	●	●	●	●	●	
Label printing	●	●	●	●	●	●	●
Print preview		●	●		●	●	
Other							
Automatic saves	●		●	●	●	●	

✓ MacUser RECOMMENDS

*Power Mac version scheduled for release in late 1994.
†Eight field types are possible; as many as 250 categories.
§No word processor, but built-in mail-merge feature works with external word processors.

needs, such as footnoting and indexing.

And if you prefer to contact people via phone, no need to let your fingers do the working. All these PIMs can dial the phone for you, either via modem or by generating tones with your Mac's internal speaker, or they can even dial your telephone by using a dialer such as the TurboDialer, from MicroMachines, or the DeskTop Dialer, from Sophisticated Circuits.

No Missed Meetings

Just about all of us time-conscious folks have at least one calendar we look at regularly. No matter if the most important item on your weekly calendar of events is a meeting with the board of directors or the time to set your VCR to record *Beverly Hills 90210* or *Melrose Place,* without a well-maintained calendar, you can lose track of those momentous events.

The breadth of *scheduling,* or calendar, features sets two PIMs apart from the others we looked at: Claris Organizer and DateBook & TouchBase Pro contain more scheduling capabilities than any of the others and implement them nicely. Ascend and Shortlist fall short in several key scheduling areas, and Full Contact, Now Up-to-Date & Now Contact, and Rae Assist offer solid, but not stellar, scheduling features.

All the PIMs include daily, weekly, and monthly scheduling views; scheduled events and to-do items are listed in each view, except for Ascend's monthly view, which includes only scheduled events.

Where Ascend really falls down, however, is in coordinating appointments with contacts. All the other PIMs link meetings with the people you're meeting.

A good PIM lets you schedule events at conflicting times, giving you a visual cue to that effect. Usually it accomplishes this by varying coloring or shading in a daily-schedule view or by placing appointments next to each other in the same time slot, as Claris Organizer does. Ascend and Rae Assist offer no such indications, and Full Contact's are difficult to see.

Shortlist lacks an easy way to enter recurring activities. You can schedule recurring activities in Full Contact, but it doesn't let you change individual instances. The rest offer a better approach: For example, Claris Organizer is flexible and allows you to make an appointment at 4 P.M. on every third Tuesday for the next 17 months, if you like.

You'll also appreciate a streamlined way to enter multiday events, such as vacations or seminars. Claris Organizer, DateBook & TouchBase Pro, and Full Contact make the process simple, unlike Ascend, Rae Assist, and Shortlist. Now Up-to-Date & Now Contact lets you create multiday events and draw a descriptive banner across multiple days in its monthly calendar view, but the event doesn't show up in the daily and weekly views.

All the PIM programs except Rae Assist and Shortlist provide alarms to remind you of important events. In Claris Organizer, DateBook & TouchBase Pro, Full Contact, and Now Up-to-Date & Now Contact, alarms are handled by system extensions and go off even when the application isn't running. You can even opt to hit a snooze button, which makes the alarm recur later. If you have Ex Machina's Notify!, DateBook & TouchBase Pro will even notify your pager when an alarm goes off.

Get the Task/Project Done

As if integrated lists of contacts and calendars weren't enough, all the PIMs we looked at offered some sort of task or project manager or to-do list. This is Ascend's one shining area, letting you prioritize and rank tasks as well as providing a set of visual cues borrowed from the Franklin Day Planner system to indicate the status of tasks.

None of the programs offers full-fledged project management — you'll see no complex Gantt charts here. Shortlist is structured to organize projects separately, so it is difficult to share data across projects. Rae Assist does a better job, in that its separate Projects section allows you to gather project-related items such as meetings, tasks, and contacts without restriction.

DateBook & TouchBase Pro expands on this concept to offer powerful project templates. Your projects may contain similar steps, so you can create templates that store all the steps involved, leaving you to simply fill in the details.

Look and Feel

A PIM may have every feature you ever dreamed of, but it's worthless if it languishes on your hard disk. And that's exactly what'll happen if you don't like the way it feels.

Preference in interface design is largely a matter of taste, and the approaches used in these PIMs vary widely. Rae Assist carries out all activities in a single window, which PowerBook users may prefer and many people may find easy to learn and maintain. Claris Organizer's simple yet effective navigational controls are easy to figure out and will have you organized quickly.

Ascend delves into some areas uncommon for a PIM — no other PIM asks you to enter your life values or personal goals. Designed as a companion to the popular Franklin Day Planner, Ascend promises life management through time management, making setting a lunch date an existential decision.

Shortlist's windows are rather stark and have a low-tech feel.

You'll juggle multiple windows if you work with DateBook & TouchBase Pro or Now Up-to-Date & Now Contact, but DateBook & TouchBase Pro does offer superior navigational controls. Full Contact's numerous windows can, at times, become overwhelming.

Although judging the usefulness of many interface elements is subjective, some things are universally appreciated. All the PIMs except Ascend and Shortlist speed data entry with smart features. Phone numbers are automatically formatted, and the first letters of words are automatically capitalized. Some PIMs, such as Full Contact and Rae Assist, even complete words or entire entries for you if they find a match elsewhere in the database. This saves time and can eliminate unwanted record duplication. The champ in ease of data entry is Rae Assist. If a company's fax number differs from its voice number by just the last four digits, just enter those digits and Rae Assist does the rest.

Now Up-to-Date & Now Contact and DateBook & TouchBase Pro provide a convenient way to access your data without even requiring the application to be running. You just pull down a menu located permanently in the upper right corner of your screen to gain instant, although limited, access to your database. With either package, you can use the menu to add events and to-do items to your schedule, search your contact database, and get core contact information. Now Up-to-Date & Now Contact's Quick Contact menu also shows you the current day's events, appointments, and to-do items.

Complex Products

Whatever your choice, a PIM can spell relief for even the most organizationally challenged. Just don't expect it to accomplish your to-do items for you.

Because PIMs come with so many features and such a variety of interfaces, finding the one that matches your needs may take time. Try to be realistic and identify your organizational needs. There's no sense spending a lot of money on a complex PIM if you need only one or two of its features. And don't think price is a good measure of quality — some of the least expensive PIMs are the best. The bottom line is, get a handle on *what* you want to organize, but take a serious look at *how* you organize before making a decision. ⌘

Shelley Cryan would be obsessively organized if she ever got around to it.

Ascend 3.0
Rating: 🐛🐛½
List Price: $200.
Street Price: $165.
Pros: Good task-management features. Based on popular Franklin Day Planner system.
Cons: No link between contacts and appointments. Poor scheduling features. Alarms don't go off if program isn't running.
Company: Franklin Quest, Salt Lake City, UT; 800-877-1814 or 801-975-9992; 801-975-9995 (fax).

Claris Organizer 1.0
Rating: 🐛🐛🐛🐛
List Price: $99.
Street Price: $50.
Pros: Easiest to learn and use. Speedy. Many sophisticated features, including document linking, but requires little RAM.
Cons: Incomplete printed documentation, although on-line help is excellent.
Company: Claris, Santa Clara, CA; 800-735-7393 or 408-987-7000; 800-800-8954 (fax) or 408-987-3932 (fax).

DateBook & TouchBase Pro 4.0 Bundle
Rating: 🐛🐛🐛½
List Price: $149.
Street Price: $90.
Pros: Polished interface. Colorful icons make it easy to spot special events. Great search facilities. Best control over customizable fields.
Cons: Two-program scheme tricky to learn. Higher-than-average RAM requirement.
Company: Aldus, Consumer Division, San Diego, CA; 619-558-6000; 619-558-8723 (fax).

Full Contact 2.02
Rating: 🐛🐛🐛
List Price: $169.
Street Price: $115.
Pros: Flexible linking capabilities offer good control over how data is organized. Can create sophisticated data filters for sorting. Full-featured word processor.
Cons: Program's flexibility is often unwieldy to manage.
Company: FIT Software, Santa Clara, CA; 800-725-3734 or 408-562-5990; 408-562-5970 (fax).

Now Up-to-Date 2.1.1 & Now Contact 1.1
Rating: 🐛🐛🐛½
List Price: $149.
Street Price: $95.
Pros: Handles event categories well. Can assign tags and keywords, so you can better define your contact list. Parts of database can be accessed when program isn't running.
Cons: Poor navigational controls. Subpar control over multiday-event creation. Two-program scheme tricky to learn.
Company: Now Software, Portland, OR; 800-237-3611 or 503-274-2800; 503-274-0670 (fax).

Rae Assist 1.5.2
Rating: 🐛🐛🐛½
List Price: $99.
Street Price: $99 (direct).
Pros: Powerful and easy-to-use linking features. Handles company information superbly. Streamlined, if unconventional, interface. Strong contact-management features. Well-implemented "smart" data entry.
Cons: No alarms. Slow to launch. Relatively large RAM requirement. Weak scheduling and printing features.
Company: Rae Technology, Cupertino, CA; 408-725-2850; 408-725-2855 (fax).

Shortlist 1.0.1
Rating: 🐛🐛½
List Price: $99.
Street Price: $57.
Pros: Small RAM and hard-disk-space requirements. Fast.
Cons: Inflexible. Poor scheduling features. No alarms. Stores only one address per contact.
Company: Brainchild, Cincinnati, OH; 800-598-2597 or 513-831-8451; 513-831-7804 (fax).

Dial-in DYNAMOS

The right ARA server can provide your office network's remote users with speed, convenience, and security.

Life used to be so simple. If you wanted to hook up to your office network while traveling, all you needed was one copy of AppleTalk Remote Access 1.0 on your PowerBook and another copy on a desktop Mac. You could then dial up your office network to download a crucial spreadsheet from the server, keep current with your e-mail, print a report on your boss's LaserWriter, or drop a memo into your assistant's shared folder. In short, anything you could do from your desktop Mac you could also do remotely.

But then Apple changed all that. When the company designed Apple Remote Access (ARA) 2.0, it added new security features and more-intelligent phone dialing options — and it separated the client software from the server software. Now, if you want to use ARA 2.0, you must buy ARA client software as well as create an ARA server of some sort by running ARA server software on your desktop Mac or on a dedicated piece of hardware.

There are reasons for buying an ARA server other than just to access the more-advanced features of ARA 2.0. For example, if you use an ARA server, you won't have to buy a costly top-of-the-line modem for each and every ARA user and you can better monitor phone-line usage. An ARA server simplifies and centralizes remote network access by managing ARA traffic through multiple modems attached to it (remote users still need their own modems, however).

To help you find the right setup for your office, MacUser Labs tested seven stand-alone ARA servers. In addition, we tested Apple's now unbundled server software for single users, Apple Remote Access Personal Server, as well as the multiuser Apple Remote Access MultiPort Server, a 12-inch NuBus card that includes four serial ports to which you attach modems; the MultiPort Server's management software lets you install as many as four MultiPort Servers in a Mac that has sufficient NuBus slots, for a total of 16 modem connections.

The seven stand-alone servers each connect directly to an Ethernet network; two — the Global Village OneWorld Remote Access Server and the Webster MultiPort/LT — can also connect to a Local-Talk network. Inside each is a processor and RAM that together manage the system and perform the data-compression and error-correction chores that are usually performed by a modem. Many are rack-mountable, making them easy to install in a network closet along with routers and hubs.

Unfortunately, while we were testing ARA servers, a major player in the Mac networking arena, Asanté, was in the midst of overhauling its Net RAS' administration software. As a result, we were unable to fully evaluate the latest version of its server. Our preliminary look at the hardware shows a promising product, however.

Likewise, we did not test the IBM 8235 ARA server. This product is a relabeled version of the Shiva LanRover/PLUS, though, so it should work identically. Prices for the IBM 8235 range from $3,255 for an eight-port Ethernet version without modems to $7,875 for an eight-port token-ring version with modems.

How Many, How Much?

The first step in converting your office to an ARA-server setup is to figure out how many ports you need. Each port accepts one modem, and each modem connects to one phone line. You can have as many simultaneous users as the server has ports.

Like other networking products (hubs and routers, for example), ARA servers can be evaluated on a price-per-port basis. The per-

By Shelly Brisbin
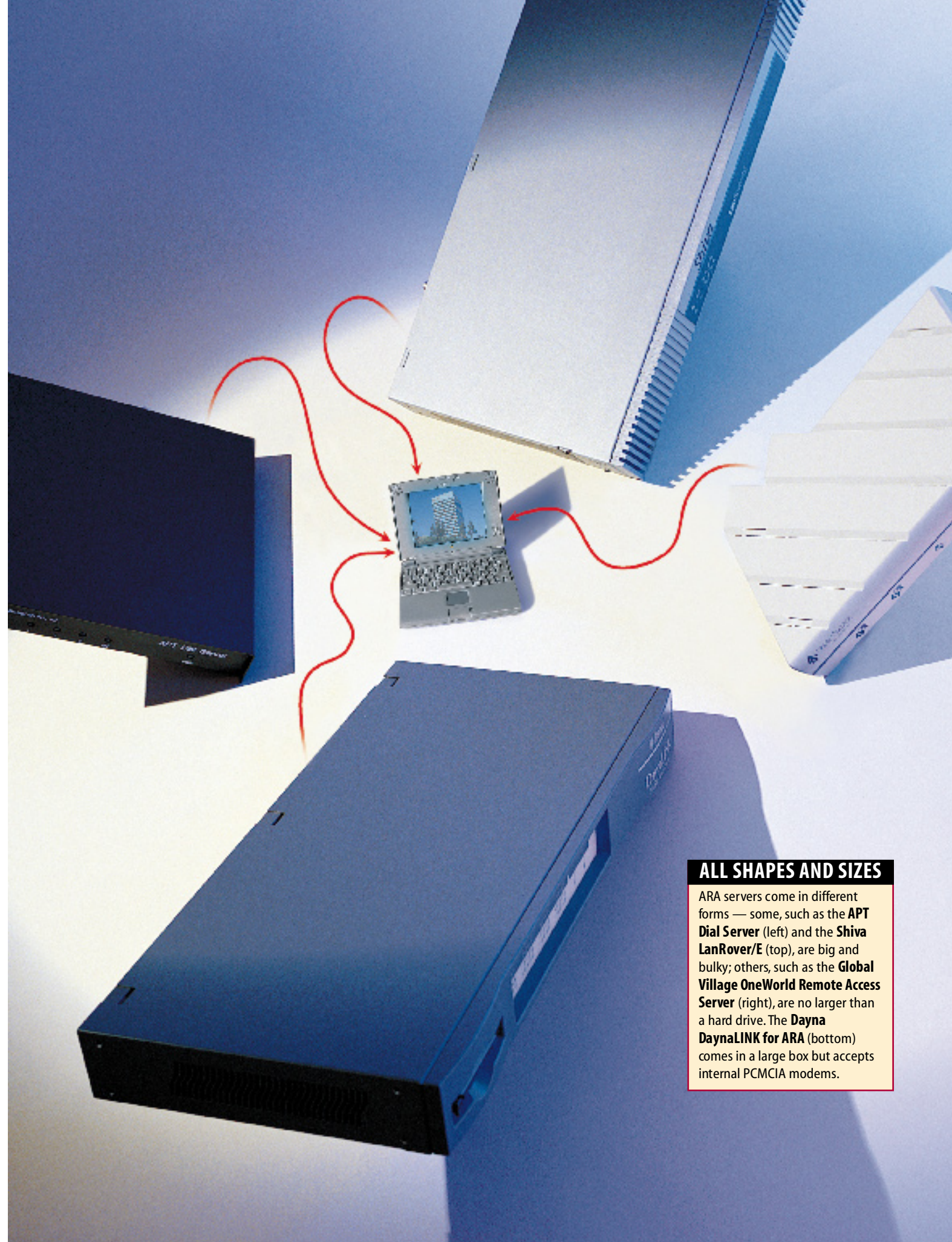
ALL SHAPES AND SIZES

ARA servers come in different forms — some, such as the **APT Dial Server** (left) and the **Shiva LanRover/E** (top), are big and bulky; others, such as the **Global Village OneWorld Remote Access Server** (right), are no larger than a hard drive. The **Dayna DaynaLINK for ARA** (bottom) comes in a large box but accepts internal PCMCIA modems.

port price of the server products we tested ranges from a low of $190 for Apple's ARA Personal Server to a high of $650 for the Global Village OneWorld Remote Access Server. But the latter server comes with two Global Village TelePort/Mercury modems, each capable of handling 19.2 kilobits per second (kbps), whereas Apple's ARA Personal Server is simply software — you need to supply a Mac to run it on and a modem.

At first glance, it seems that the least expensive multiport product, on a per-port basis, is the Apple ARA MultiPort Server. This server product and the four-port expansion kit we tested sell for a combined street price of $2,415, or $300 per port — but you must supply a NuBus-equipped Mac to run it on. The three-port APT Dial Server is the costliest server that doesn't come with modems, at $1,695, or $565 per port.

Keep in mind too that some servers come bundled with ARA client software, which can also reduce the final price per port, because otherwise you would need to purchase the software from Apple.

Most ARA servers sold without modems support several third-party modems. Server vendors include an assortment of ARA *CCLs,* the *connection control language* files that ensure compatibility between a server and the modems you use with it. Apple includes several CCLs with its ARA client software, and Mac-savvy modem vendors usually ship them with their products.

The two Shiva LanRovers, the Telebit NetBlazer ST, and the Dayna DaynaLINK for ARA don't use ARA CCLs. The Shiva LanRovers rely on an internal database of modem parameters. As when choosing a CCL, you designate your modem via a pop-up menu. This approach works well if your modem is supported; if it isn't, you must find out your modem's *initialization string* — a call to the vendor's tech-support service is a good idea — and enter it into the LanRover's database. The Telebit NetBlazer ST also stores modem initialization strings internally, but it does not offer pop-up menu choices.

Instead of desktop modems, the Dayna DaynaLINK for ARA requires PCMCIA modems, modems that come on cards about the size of a cigarette pack and that slide into slots in the back of the DaynaLINK. The server is set up to configure itself for all currently shipping PCMCIA modems. The PCMCIA modems can be more expensive than conventional modems, but since they don't each require a power cord, using them keeps cable clutter to a minimum.

When you purchase modems for an ARA server, choose the fastest you can afford. Like all other telecommunications schemes, ARA serves you best when benefiting from a high data-transfer rate. At speeds below the 9,600-bps rate of a V.32 modem, you're going to be dissatisfied. And remember: A telecommunication connection is only as fast as the slower modem in a client/server pair — if you get high-speed modems for your ARA server, make sure you get equally fast ones for remote users.

If you choose a multiport ARA server, your investment in high-speed modems will be worthwhile only if the server scales well — that is, if it retains its speed when most or all of its ports are in use. We discovered some radical speed differences among servers and also learned that the speed of both Apple server products is highly dependent on the host Mac's power and whether or not the same Mac is also being used for other functions (for example, as an AppleShare server). For a detailed description of our testing and an analysis of the results, see the "How We Tested" sidebar.

Administration, Security, and Convenience

Although speed is likely to be the primary concern of ARA users dialing in to a network, management and security features are more important to the network administrator back at the office. User accounts need to be set up and maintained, and the security of the network must be kept inviolable. In most cases, server manufacturers have made these chores easy by allowing management of the server from any Mac on the network that's loaded with the appropriate management software. The accounts and settings the administrator specifies are downloaded to the ARA server and stored there.

Apple's server products, however, don't afford this convenience; they must be managed from the Mac on which they're installed. Although this is only an annoyance at the office, it's a real problem when you need to make a change from a remote location. Using Farallon's Timbuktu is a workaround — but an added cost.

The Telebit NetBlazer ST is the only server we tested that doesn't

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The Bottom Line

MacUser ZD LABS SPEEDY, FEATURE-RICH Apple Remote Access (ARA) server products can't guarantee mobile productivity, but they can make connecting to your office network easier. Choose a fast server product with a low cost per port and with well-designed management software that makes server administration simple and secure. If you plan to use a server for more than just ARA, look for routing, fax, and multiprotocol support.

⊕ = OUTSTANDING
● = ACCEPTABLE
⊖ = POOR

	PRICE/ PERFORMANCE	CUSTOMER SERVICE	MANAGEMENT SOFTWARE	SERVICE
Apple ARA MultiPort Server	⊕	●	●	●

You'll need to supply a Mac, but if you have a powerful one to spare, you'll find the ARA MultiPort Server ($1,299 – $6,295 list, $1,290 – $4,665 street) fast, and it's easy to install and manage. Documentation is good, and expansion is easy.

Apple ARA Personal Server	⊕	●	●	⊖

If you need only single-port access and miss the simplicity of ARA 1.0, your best bet is Apple's ARA Personal Server ($250 list, $190 street). Like its multiport sibling, it's easy to use and includes good documentation.

Shiva LanRover/PLUS	●	●	●	⊕

Cross-platform offices will find the LanRover/PLUS ($6,499 – $8,499 list, $5,260 – $6,875 street) to be a worthy choice for busy ARA sites. You can administer the LanRover/PLUS from a Mac or a PC, and it provides support for IP and IPX dial-in and dial-out as well as routing and IP gateway functions.

Dayna DaynaLINK for ARA	●	●	⊕	●
Shiva LanRover/E	●	●	●	⊕
APT Dial Server	⊖	⊕	⊖	⊖
Global Village OneWorld Remote Access Server	⊖	⊕	●	⊖
Telebit NetBlazer ST	⊖	●	⊖	⊕
Webster MultiPort/LT	⊖	●	⊖	●

Listing is alphabetical within groups of equal mouse ratings.

Creating User Accounts / good management software makes the difference

DON'T BE SURPRISED if once you have an ARA server up and running, you get a lot of requests for access. The best management software makes it easy to set up accounts and gives you numerous access and security options. Here's how ARA server software stacks up:
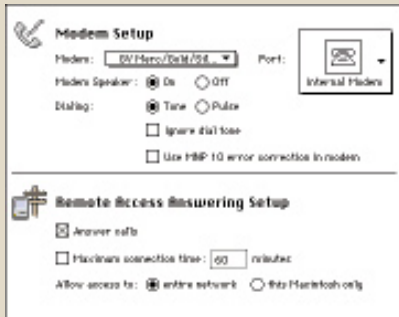
Apple's ARA Personal Server looks and acts just like the ARA 2.0 client software. But unlike the client software, the server software can answer incoming ARA calls.

With Dayna's key-ring metaphor for its server's software, you assign access privileges to a specific style of key. You then give that key to each user allowed to have those privileges. Users can build up key rings full of keys. The DaynaLINK for ARA is the only server that lets you limit access based on the time of day a user calls.

The Global Village OneWorld Remote Access Server's software relies on a passport metaphor for assigning access privileges to users and groups. Once you've set up a passport, you can give it to any user or group of users. Passports can also include access privileges for Global Village's fax or dial-out server software.

The Apple ARA MultiPort Server's software offers the simplest interface of all the products we tested. For example, all the new-user setup options are contained in this window. Unfortunately, the software lacks advanced features such as zone and device hiding.

The software for the Telebit NetBlazer ST has a command-line interface that strongly resembles that of UNIX. To perform administrative duties, you must use a telecommunications program and an extension such as Apple's ADSP Tool to communicate with the server over a network.

Shiva's Net Manager software for the LanRovers contains a wide variety of features and sports a clean, organized interface. For each user, you can specify such items as the length of connection time, the type of dial-back, and which devices or zones should be hidden.

come with management software that can be installed on a Mac; instead, the NetBlazer ST's software is installed on the server itself. To access its UNIX-like interface from a Mac, your best bet is to use Apple's ADSP (AppleTalk Data Stream Protocol) Tool and a telecommunications program such as Software Ventures' MicroPhone Pro. But this is not a straightforward method. It's much easier to manage the NetBlazer ST's software from a Microsoft Windows-based PC on the same network. Otherwise, be prepared for a trip back in time to the dark days of the command-line interface.

No matter how you access an ARA server's administrative capabilities, the bread-and-butter work of ARA management includes the creation and maintenance of user accounts, the setting and modification of passwords, and the designation of restrictions on the amount of time each user can stay connected to the server. Although interfaces differ, creating user accounts is straightforward on all the servers we looked at.

The Global Village OneWorld Remote Access Server and the Dayna DaynaLINK for ARA go a step further than the others. Their management software lets you define *master accounts* — sets of commonly used privileges — that you can grant to one user or simultaneously to more than one. Master accounts make it easy to manage several sets of privileges and to quickly change the access level of an entire group of users. Global Village calls these accounts *passports;* Dayna calls them *key rings.* You might, for example, create a master account that allows users to dial in only during evening hours and limits access time to one hour per day and give this account to travelers who dial in from their hotel rooms in the evening.

Apple comes closest to offering the convenience of the passport and key-ring systems. As with AppleShare and System 7's personal file sharing, the Users and Groups feature of the two Apple server products lets you assign access privileges to users and to groups of users. AppleShare Users and Groups files can be imported into the Global Village OneWorld Remote Access Server — and the Global Village server even allows you to import user information created with the Shiva LanRovers' management software.

Seven of the nine products we tested allow remote clients using ARA 2.0 to change their own passwords, improving users' control over the security of their remote connection. ARA Personal Server forces you to change passwords via the administration software installed on the server. The Telebit NetBlazer ST does not support ARA 2.0. These two products also don't support *password aging*, a useful security measure that forces users to change their passwords at an administrator-specified interval. (We don't find this to be a big handicap for ARA Personal Server, however, since this product is

How We Tested / some ARA servers get stuck in heavy traffic

MacUser ZD LABS TO KEEP EVERY DIAL-IN USER HAPPY, first estimate how many simultaneous users you'll have at any one time and then choose an ARA server with at least that many ports — and one that performs well when all of its ports are busy. To find out just how much traffic each server could bear, we put all of them through five rigorous tests.

First, we equipped most of the servers with as many 14.4-kbps modems as they could handle, to a maximum of eight. We tested two of the server products in less than their maximum configuration. One of them was the Apple ARA MultiPort Server. This 12-inch NuBus card supports 4 modems and comes with software that can manage as many as four ARA MultiPort Server cards in one Mac, for a maximum of 16 modem connections. To find out how the ARA MultiPort Server performs in Macs with different processors, we installed two cards in a Mac IIci running AppleShare 3.0 and in a Quadra 950 running AppleShare 4.0.

The Telebit NetBlazer ST, the other server we tested in less than its maximum configuration, can support as many as 26 modems, but Telebit recommends that you use only 24 ports for remote access. (The remaining two ports are intended for use with other services, such as a leased T-1 line or another high-speed communications channel.)

The ARA MultiPort Server systems and the NetBlazer ST were each tested with a maximum of eight modems connected, as were the eight-port Dayna DaynaLINK for ARA and the Shiva LanRover/E and LanRover/PLUS. The Webster MultiPort/LT supports a maximum of four modems; the APT Dial Server, three; the Global Village OneWorld Remote Access Server, two. The ARA Personal Server software can manage one modem connected to the host Mac; we tested it on a Quadra 950 running AppleShare 4.0.

1 PORT
✛ Apple ARA Personal Server in Quadra 950

2 PORTS
● Global Village OneWorld Remote Access Server
▲ APT Dial Server

4 PORTS
◆ Webster MultiPort/LT

8 PORTS
■ Apple ARA MultiPort Server in Mac IIci
○ Apple ARA MultiPort Server in Quadra 950
△ Dayna DaynaLINK for ARA
◆ Shiva LanRover/E
✦ Shiva LanRover/PLUS
⊞ Telebit NetBlazer ST

UNCOMPRESSED TEXT FILES

Reading
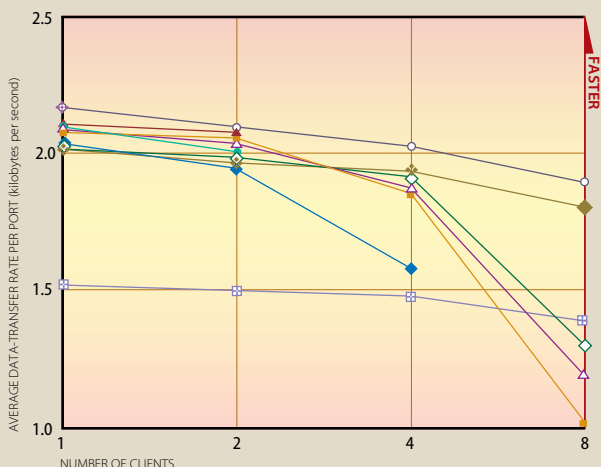
Writing
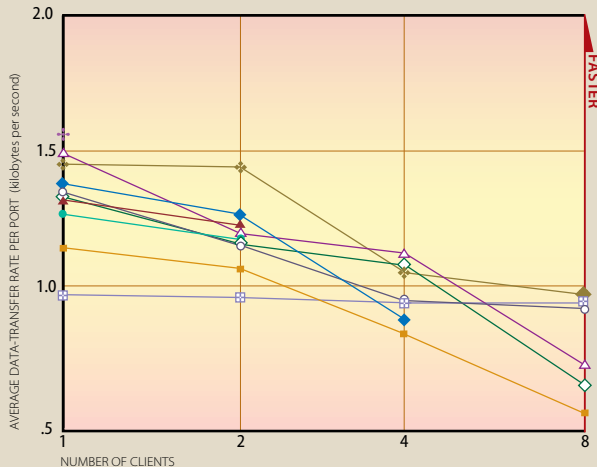
Small, highly compressible files such as memos, reports, and other text files make up the majority of data that remote users most often need to transfer. To find out how the ARA servers fared with these types of files, including how well their processors could perform ARA's compression duties, we first read a 100K folder containing five uncompressed text files and then wrote the same folder to the AppleShare server. Note the increasing difference in speed between the ARA MultiPort Server cards in a Quadra 950 and in a IIci as loads increased.

designed for a single user who acts as both client and administrator.) Unfortunately for the security-conscious, the Dayna DaynaLINK for ARA also doesn't support password aging, despite its ARA 2.0 compatibility.

All but ARA Personal Server let you hide selected network zones from one or more ARA users, either for security or to limit network traffic. (Again, because ARA Personal Server is designed for one user, the inability to hide zones is insignificant.) The APT Dial Server and both Shiva LanRovers also let you hide network devices.

Beyond ARA

Many ARA servers can also perform other duties. The Webster MultiPort/LT has one Ethernet port and four DIN-8 serial ports; the serial ports can each support a modem or connect to LocalTalk. Thus the server can also act as a router between two networks, managing traffic between them and improving network speed. (The APT Dial Server has DIN-8 ports, but its software does not support routing.) Both Shiva LanRovers and the Telebit NetBlazer ST also have Ethernet and serial ports, but their serial ports are not DIN-8 ones and therefore cannot be used as LocalTalk ports. You can, however, set these ARA servers up in their respective sites, have them call each other, and route data between two remote networks.

With the right client software, users can send faxes or make calls to on-line services or bulletin boards from their office machines with some of these products. Of course, if you want fax capability, the modems you connect to the Dial Server and the MultiPort/LT must support fax transmission (as do the Global Village TelePort/ Mercury modems that come with the OneWorld Remote Access Server). APT provides the software you need — COM Dialout — and allows you to distribute it freely to all clients. Webster offers

COMPRESSED GRAPHICS FILE

Reading
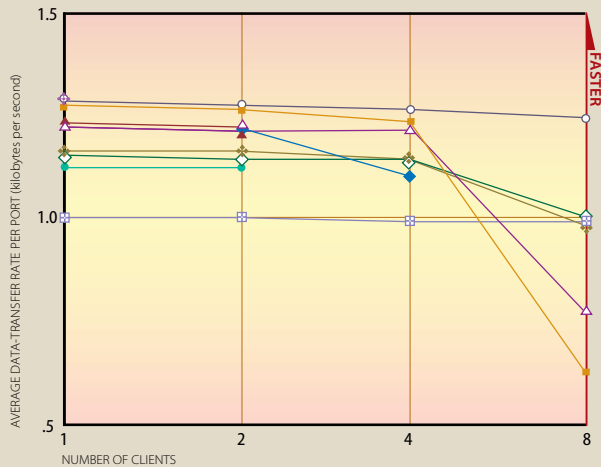
Writing
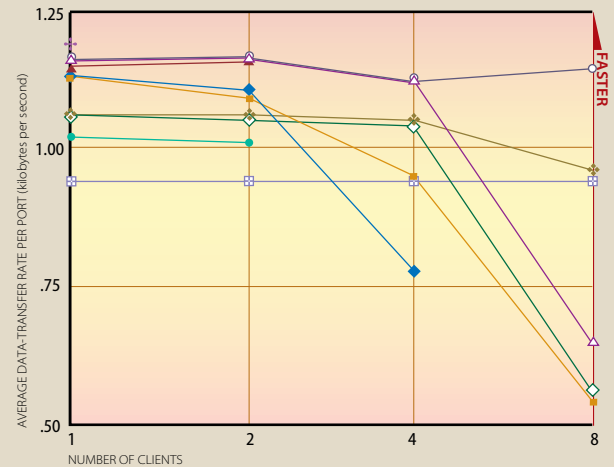
If you're transferring large graphics files, you can compress them before sending them or you can let the ARA server compress them for you. In our tests, we transferred a 10-MB Adobe Photoshop file that we had first compressed to 416K, using Photoshop's JPEG compression option. In the first test, clients read the file; in the second, the clients copied the file to the AppleShare server. Note that, unlike when transferring uncompressed text files, the speed of most of the servers did not degrade until eight clients accessed them.

We then configured eight Mac IIci's as ARA clients and equipped them with 14.4-kbps modems from Practical Peripherals. Although the Global Village OneWorld Remote Access Server comes bundled with Global Village TelePort/Mercury 19.2-kbps modems, we did not exploit their additional speed, because of the 14.4-kbps limit of the clients' modems.

We used the IIci's to access a Quadra 950 running AppleShare 4.0. This AppleShare server was connected to an Ethernet network, as was each ARA server. We then used the IIci's to dial in to each ARA server and copied two types of files to and from the AppleShare server. We started our testing gently, with only one client connected, and then upped the load to two, four, and eight simultaneous clients, depending on the number of modems connected.

The Telebit NetBlazer ST's scheme of tapping the processing power of the Telebit WorldBlazer modems attached to it meant that the NetBlazer ST suffered only a slight degradation in speed as clients were added, even though its file-transfer rate was low at small client loads. All the other servers slowed as more clients accessed them, except, in some cases, the ARA MultiPort Server installed in a Quadra 950 running AppleShare 4.0 and the Global Village OneWorld Remote Access Server.

QUICKMAIL
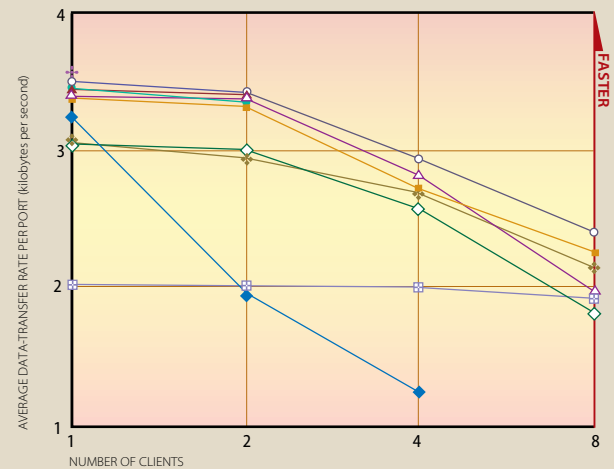
To see how well the ARA servers handled QuickMail, we timed how long it took to retrieve a 993K Excel file enclosed within a QuickMail message. Even with eight clients, most of the servers were faster than when performing any other test, since QuickMail isn't burdened by Finder overhead.

Stalker Software's PortShare Pro for $89 (10 users) or $299 (unlimited users). Pricing for fax and dial-out software for the Global Village OneWorld Remote Access Server was not available at press time.

Finally, some of the servers we reviewed can be accessed by methods other than using ARA. If your office includes Macs, PCs, and UNIX workstations, it's possible to give all of their users remote access to your network if you choose a server that supports *protocols* — network languages — other than AppleTalk and ARA's. The most common protocols are Novell's IPX, used for access to Novell NetWare servers, and IP, the standard for UNIX access, including access to the Internet. Only the Shiva LanRovers and the Telebit NetBlazer ST support IPX. If you need IP, your choices broaden to include the Webster MultiPort/LT. The LanRover/E and the LanRover/PLUS add IP *forwarding* access for Mac users.

The Choice Is Yours

If the well-being and morale of your business would benefit from a fast, seamless, and easily manageable remote-access system, the question is not whether or not you should equip your network with an ARA server but which one you should choose.

If you're looking for a one-user, one-server setup, ARA Personal Server running on a Mac more than fills the bill. A powerful Mac running this software was the fastest server we tested, and even with a slower Mac, you get more-than-acceptable speed. It lacks sophisticated administrative controls, but for the simplest of ARA environments, with only one phone line, it's an elegant option.

If you have a busy, Mac-only office, the choice is a bit tougher. The Dayna DaynaLINK for ARA is attractive for offices in which four ports are sufficient, but the choice of high-speed PCMCIA modems is limited. Its software has an attractive interface and includes most

figure 1

Features of ARA Server Products / what they can do

	✓ Apple ARA MultiPort Server 2.0.1	✓ Apple ARA Personal Server 2.0.1	APT Dial Server	Dayna DaynaLINK for ARA	Global Village OneWorld Remote Access Server	Shiva Lan-Rover/E	✓ Shiva Lan-Rover/PLUS	Telebit NetBlazer ST	Webster Multi-Port/LT
List price (min. ports)	$1,299 (4)	$250 (1)	$1,695 (3)	$2,999 (8)	$1,099 (1)	$2,899 (4)	$6,499 (4)*	$3,199 (2)†	$1,995 (4)
List price (max. ports)	$6,295 (16)	NA	NA	NA	$1,899 (2)	$3,999 (8)	$8,499 (8)*	$5,895 (26)	NA
Street price (min. ports)	$1,290 (4)	$190 (1)	$1,695 (3)	$2,180 (8)	$975 (1)	$2,555 (4)	$5,260 (4)*	$2,430 (2)†	$1,790 (4)
Street price (max. ports)	$4,665 (16)	NA	NA	NA	$1,300 (2)	$3,495 (8)	$6,875 (8)*	$4,705 (26)	NA
Standard RAM	§	§	512K	2 MB	1 MB	1 MB	1 MB	4 MB	1 MB
Max. RAM	§	§	512K	32 MB	9 MB	3 MB	3 MB	4 MB	4 MB
Includes modems				●◊	●		●◊		
Supports internal modems				●**	●		●		
LocalTalk connection	●	●			●				●
RJ-45 connection	§	§	●	●		●	●	●	●
BNC and AUI connections	§	§	●	●		●	●	●	●
Token-ring connection	§	§						●	
LAN routing						●	●	●	●
ARA 1.0-compatible	●	●		●	●	●	●	●	●
ARA 2.0-compatible	●	●		●	●				
TCP/IP-based dial-in						●	●	●	
IPX dial-in						●	●	●	
SLIP or PPP connections						●	●	●	
Supports SNMP	●					●	●	●	●
Multiple-server administration			●		●	●	●	●	●
PC-based administration available						●	●	●	
Group access privileges	●	●	●	●	●	●	●		●
AppleShare Users and Groups import	●				●				
User-changeable password	●	●	●		●	●	●		●
Password aging	●		●			●	●		●
Zone hiding	●		●	●	●	●	●	●	●
Device hiding			●						
Dial-out			●		●◊	●	●		●
Faxing					●◊				
Toll-free tech support	●	●	●					●	●
Money-back guarantee			●		●	●	●		●
Service contract available						●	●	●	●
FCC Class B certification	●	NA			●			●	
Warranty	1 year	NA	2 years	2 years	3 years	1 year	1 year	1 year	1 year

✓ MacUser RECOMMENDS
*Price includes optional modems.
§Depends on the type of Mac used as the host.

†We tested the more cost-effective 10-port configuration, available for $4,099 list, $3,270 street.
◊Optional.
**PCMCIA modems only.

important management features. The server itself is inexpensive, and the cost of PCMCIA modems should drop as they become more widely used.

Our nod for the best ARA server product for Mac-only offices goes to Apple's ARA MultiPort Server, however. Install it in a powerful Mac, and you get a server that is fast and convenient, performs well under heavy use, and can accommodate as many as 16 users. A drawback is that the software lacks some of the best server-management, security, and networking features of its competitors. And remember: To use one or more MultiPort Servers to their best advantage, dedicate a powerful 68040 Mac as host.

Finally, if your business depends on a busy, ecumenical network of Macs, PCs, and UNIX workstations, you'll find a lot to like about the Shiva LanRover/PLUS. With its cleanly designed, easy-to-use management software, it's more Mac-friendly than its closest rival, the Telebit NetBlazer ST. Also, its TCP/IP and IPX capabilities make the LanRover/PLUS a versatile corporate citizen, although the NetBlazer ST's token-ring connection and support for as many as 26 clients give it an edge in enterprise-scale installations.

Shelly Brisbin is a *MacUser* associate editor. ZD Labs' senior project leader Alex Ho managed the testing for this report.

Directory / vendors of ARA server products

Apple Computer
Cupertino, CA
800-233-4846
408-862-3385
408-767-2775 (fax)

APT Communications
Ijamsville, MD
800-842-0626
301-874-3305
301-874-5255 (fax)

Dayna Communications
Salt Lake City, UT
800-531-0600
801-269-7200
801-269-7363 (fax)

Global Village Communication
Mountain View, CA
800-736-4821
415-390-8200
415-390-8282 (fax)

IBM
Research Triangle Park, NC
800-426-2255
800-426-4329 (fax)

Shiva
Burlington, MA
800-458-3550
508-788-3061
508-788-1301

Telebit
Sunnyvale, CA
800-835-3248
408-734-4333
408-734-3333 (fax)

Webster Computer
San Jose, CA
800-457-0903
408-954-8054
408-954-1832 (fax)

PAGE LAYOUT /
UNIQORN LOOKS TO GRAB DTP BY HORN

PAGE-LAYOUT UPSTARTS that seek to dethrone the champs borrow liberally from QuarkXPress or Aldus PageMaker. But a new program from England takes a fresh approach to page layout that, if its developer, SoftPress Systems, can deliver, may provide an interesting alternative to the reigning products.

As we noted previously (see "Golly GX," December '94, page 119), UniQorn is one of the few programs that will fully support Quick-Draw GX features — for example, the appropriate slider bars pop up for controlling the weight and width variations built in to GX fonts such as Skia.

By pinning its page-layout hopes on QuickDraw GX, SoftPress plans to make UniQorn the foundation of a high-end-publishing strategy that includes not only paper-based documents but also multimedia projects. Many UniQorn features are geared to the re-purposing of information, so that, for example, a printed magazine can be easily turned into an interactive movie. One example of this strategy is UniQorn's Flexible Presentation feature, which lets you place objects relative to page orientation and size. When changes are made to a document's setup, the frames adapt accordingly.

UniQorn also takes a flexible approach to style sheets. Smart Outliners create style sheets for text and graphics on the fly. The Outline palette reflects the relationships among hierarchical styles and tracks document structure and content. You can tag text in the program's Galley, or story-editing, view — a plus for on-line distribution.

Like QuarkXPress, UniQorn offers a frame-based metaphor for page creation. But in UniQorn, frames can contain either text or graphics and can be transformed into any quadratic-curve shape. The program's Smart Outliners record the relationships between pages and nested frames. Layout, Galley, and Thumbnail views can be on-screen simultaneously.

UniQorn boasts other features, such as object grouping and locking, text wrap around overlapping objects, synthetic style variations (weight, width, slant) for text, and trapping by object or color.

SoftPress doesn't yet have a U.S. distributor, but expect UniQorn to be available next spring for $695 to $895. 44-993-882588; 44-993-883970 (fax). / **Pamela Pfiffner**

CLARIFICATIONS /
The Right Stuff

IN THE "GET INFO" supplement to our November issue, Stephen Johnson's photograph of Yosemite Falls was inadvertently cropped. *MacUser* respects the rights of photographers to maintain the integrity of their images, and we regret the error. Here is the image as it should have appeared. Enjoy. / PP

©1994 STEPHEN JOHNSON

COLOR PRINTERS /
More True Colors from Kodak

REALISTIC COLOR is something you would expect from a Kodak color printer, and the new 8600 PS dye-sublimation printer ($9,995) delivers on that promise, with built-in color technology and new ink ribbons that lay down a protective coating over the dyes.

Unlike the 8300, which it replaces, the Kodak 8600 PS includes a PostScript Level 2 interpreter. For fast printing of raster files such as large TIFF images, the 8600 PS comes with a plug-in that lets you export images directly from Adobe Photoshop. An 8-x-10-inch color image prints in about 75 seconds, according to Kodak.

The 300-dpi 8600 PS printer incorporates Kodak's UltraColor technology, which improves color fidelity. Moreover, the printers

employ Kodak XtraLife ribbons, available in black ($175) and cyan, magenta, and yellow ($231). These ribbons laminate the printout after laying down inks, thereby improving color permanence (sublimation dyes are notoriously light-fugitive). Also, the printer supports oversized media for image areas as large as 8.5 x 12 inches.

The printer comes with 32 MB of RAM, expandable to 64 MB, and is powered by a MIPS RISC processor. The 8600 PS ships with SCSI, parallel, and LocalTalk connections; the 8600, a raster-only model available for $8,995, lacks LocalTalk. Support for EtherTalk, NetWare, and TCP/IP is available through an optional $995 interface card. 800-235-6325. / PP

Seven Steps to Superior Scans

Want the best results from your desktop color scanner? Follow these steps to get on the road to better color images. BY BRUCE FRASER

THE GOOD NEWS is that many low-cost flatbed scanners today are capable of scanning more colors than their 24-bit predecessors, which capture only 8 bits per color per pixel. Many scanners today read in 9, 10, and even 12 bits per color per pixel. The bad news is that these scanners must throw away those extra bits to produce 8 bits per color per pixel as their output. The trick, then, is to get the *right* 8 bits coming in. Adjusting tone and color after the fact in Adobe Photoshop doesn't take advantage of the extra bits the scanner captures. But if you make your adjustments in the scanning software itself, you'll be using all the data the scanner can capture.

Four basic software tools are invaluable in getting good scans: the histogram (a bar chart that graphs the number of pixels against the number of gray levels), the on-screen densitometer (a numeric display that shows the gray-scale, RGB, or CMYK values of the pixel under the pointer); the levels control (a dialog box that lets you set black point, white point, and gamma); and the curves control (a dialog box that lets you shape the tone curve of the image by placing points on the curve). Most scanner software has at least three of these tools.

Because Photoshop is familiar to most Mac graphic artists, we'll discuss how these tools work in Photoshop, in which they're represented by the Histogram command, the Info palette, the Levels command, and the Curves command, respectively. Experimenting in Photoshop is an excellent way to get a feel for how these controls work, and the skills you learn in Photoshop are easily transferable to your scanning software.

When you're experimenting, save the Levels or Curves settings separately from the image so you can try different combinations on various images. As soon as you have applied a Levels or Curves tweak to the image, select the Undo command to get back to the raw scan. You can use the Undo

command to toggle between the raw scan and the effect of your tweak, giving you an immediate before-and-after comparison. When you've figured out in Photoshop exactly what needed to be done to the scan, go back to the scanner software and rescan the image, using settings that duplicate the tweaks you made in Photoshop as closely as possible. After a while, you'll discover that your initial scans are much closer to the desired results as you exploit the power of the scanner's controls.

Resolution Solution

When you scan an image, you have four main concerns — the resolution, the tonal range, the color balance, and the sharpness. The first, resolution, is relatively easy to figure out. We'll discuss the other three in the pages that follow.

The resolution you need depends on the size of the original image, the size at which you want to reproduce it, and the output method you want to use. For halftone output, whether from a laser, desktop inkjet, or thermal-wax-transfer printer or on image-setter film destined for press output, the rule of thumb is simple: You want the number of pixels per inch, at the output size, to be between 1.5 and 2 times the line-screen frequency you'll use for output. For instance, if you're scanning for a 133-line screen, which is what's used for the photographs in this magazine, your output resolution needs to be between 200 and 266 pixels per inch (ppi). The conservative approach is simply to multiply the line-screen frequency by 2 — you may be able to get away with a lower resolution, but there's little or no reason to use a higher one.

To figure out your input, or scanning, resolution, multiply your output resolution (line screen times 2) by the scaling factor you need — the output size divided by the

input size. For example, if you want to reproduce a 1-x-1.5-inch original such as a 35mm slide at 6 x 9 inches, using a 150-line screen, the formula would be line-screen frequency x 2 x (output dimension/input dimension), or 150 x 2 x (6/1) = 1,800. It doesn't matter which dimension you plug in

to the formula, as long as it's the same for output and input.

If you're scanning for output on a continuous-tone device such as a continuous-tone film recorder or a dye-sublimation printer, you simply want your output resolution to correspond to the resolution of the scanning device. The formula for the scanning resolution then becomes (output dimension/input dimension) x output-device resolution.

You should always get the tonal range correct before fixing the color balance. If you save your adjustments as settings files, you can go back and adjust the tone and then apply all of your settings simultaneously, if the scanning software allows you to, or if it doesn't, then as a single operation in Photoshop. Once you have the tone and the color right, you can apply sharpening to the image. Got that?

Turn the page for seven steps to getting sharp scans with good tonal range and proper color balance.

Contributing editor Bruce Fraser has been reviewing scanners for years. He is coauthor of the upcoming *Real World Photoshop*, to be published by Peachpit Press.

1. UNDERSTAND THE HISTOGRAM.

One of the most important tools for analyzing scans, this bar chart can tell you a lot about scans at a single glance. A histogram that ends in a cliff at the left (shadow) end of the scale, as shown in figure 1a, indicates a scan in which shadow detail is lost. If it ends in a cliff at the right (highlight) end of the scale, as in figure 1b, you've blown out, or overexposed, the highlight detail. A correctly exposed scan produces a histogram like the one in figure 1c, with relatively few pixels at either the darkest value (0) or the lightest value (255).

figure 1a

figure 1b

figure 1c
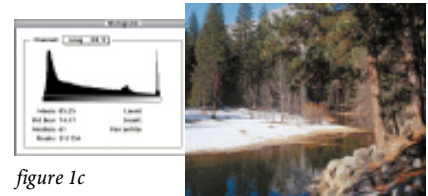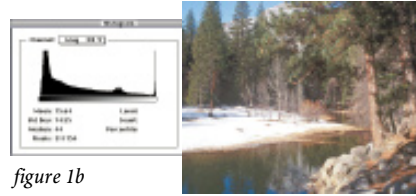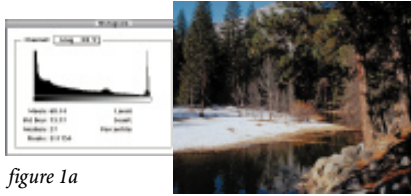
2. DO AS MUCH AS POSSIBLE IN THE SCANNING SOFTWARE ITSELF.

Finish adjusting the tone and color balance before scanning. If you make the adjustments postscan, you have only 8-bit data to start with, and each time you adjust the tone or the color balance, you'll lose some image data.

A histogram of an image scanned with the scanner's gamma set to 1.4 (figure 2a) reveals that the scan contains information at each of the 256 gray levels 8-bit data can represent. Gamma controls map input levels to output levels. A gamma value greater than
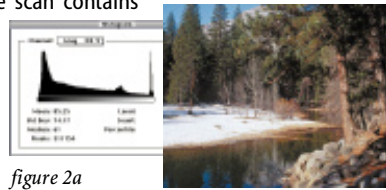
figure 2a

1.0 lightens the midtones, and a value less than 1.0 darkens the midtones. Figure 2b shows a histogram of the same image scanned with gamma set at 1.0 and then corrected postscan to a gamma of 1.4 in Photoshop. Notice that it has lost tonal information at the shadow end of the tone scale, as indicated by the comblike structure, and that the information in the midtones has become posterized, as indicated by the spikes in the lighter range.

figure 2b
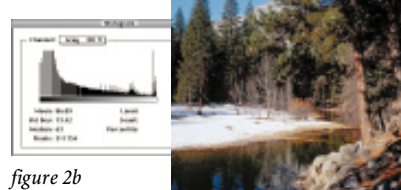
3. USE LEVELS INSTEAD OF BRIGHTNESS/CONTRAST.

It's tempting to brighten an image with controls called Brightness/Contrast. But because doing so simply shifts the entire image up or down the brightness range, you always end up blowing out the highlights or plugging up the shadows if you use Brightness/Contrast. Figure 3a shows the histogram of a well-exposed but slightly dark scan. If you simply increase the brightness, you'll get something like figure 3b — all the highlight detail has been lost, and you wind up with a lot of solid white pixels.

By using the Levels command, you can adjust the brightness of the midtones without sacrificing the detail in the shadows or highlights. Figure 3c shows the histogram that results from applying a gamma adjustment of 1.2 to the image. If you do have to make adjustments in Photoshop, this is the maximum amount of gamma adjustment we recommend applying postscan — much more than that will produce posterization in the image.

figure 3a

figure 3b

figure 3c
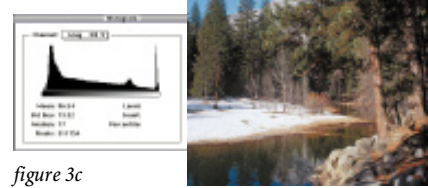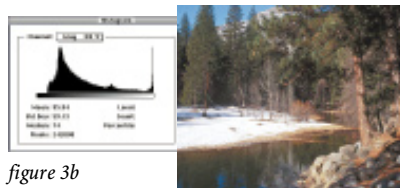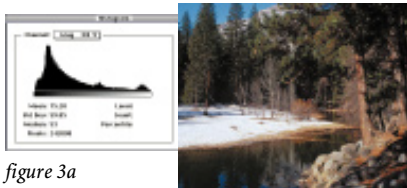
4. FOR MORE-DELICATE ADJUSTMENTS, USE CURVES.

Everything you can do with the Levels command you can do with the Curves command, but Curves is much more powerful. When you adjust Levels (gamma is the middle value under Input Levels), what you're actually doing is bending the tone curve around a single point in the middle, as shown in figure 4a. But the Curves command allows you to make much more delicate adjustments to the tonal range. The curve in figure 4b opens up the extreme shadows a little and spreads the highlight detail across a slightly wider range. The resulting histogram is shown in figure 4c. Compare it with that shown in figure 3c — it's still holding the shadow and highlight detail, but the shadow gradations are smoother and the highlights have been spread over a greater range. When you're moving a point on the curve, it's usually helpful to first anchor the curve with two points, one on either side of the point you're moving. This localizes the effect of the move to a small part of the tonal range. If you don't do this, you will change the shape of the entire curve, and the results can be quite dramatic.

figure 4a

figure 4b

figure 4c

5. USE CURVES AND THE INFO PALETTE TO SET THE NEUTRAL BALANCE.

Once the tonal range is right, adjust the individual curves for the red, green, and blue channels to get good neutral balance. If you balance the neutrals properly, the rest of the color should just fall into place.

figure 5a

Even if you have a well-calibrated monitor, color casts are not always easy to see. Photoshop's Info palette, or your scanner software's info display (sometimes called an on-screen densitometer), can help you identify and correct color casts. Look for areas in the image you know should be neutral — ideally, you should find a neutral highlight, a neutral shadow, and a neutral area in the midtones — and then look at the RGB values the Info palette displays when you move the pointer over these areas. The values for all three channels should be about equal.

figure 5b

If one channel has a much lower or much higher value than the others, you need to adjust that channel's curve to bring the neutrals into balance. While in Photoshop's Curves dialog box, click the pointer on the image to show you the location on the curve of the point on which you're clicking. Adjust the curve so that the output value matches those of the other channels for the point you're adjusting. Figure 5a shows a scan that's a little dark in the midtones and has an overall red cast. Figure 5b shows a curve that adjusts the overall tonal range of the scan, and figure 5c shows the curve needed to remove the red cast from the image. Figure 5d shows the corrected scan.
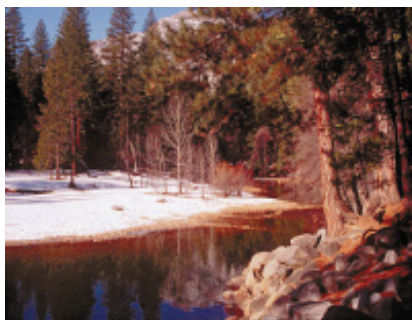
Once you've adjusted both the overall curve and the individual color curves to your satisfaction, you can apply them to the image in Photoshop. But if your scanner software allows you to set curves, you'll get even better results if you go back and rescan the image, using curve settings as close as possible to the ones you've created in Photoshop — a few scanners even allow you to download Photoshop curves directly to the scanner.
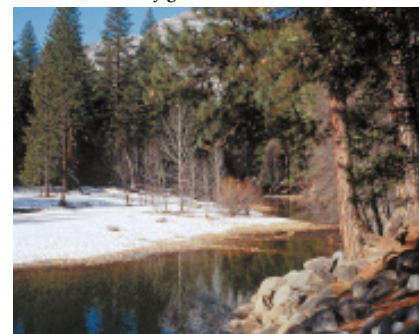
figure 5c

figure 5d

6. SHARPEN IMAGES BY USING UNSHARP MASK IN PHOTOSHOP.

Although more and more desktop scanners offer some kind of built-in sharpening, Photoshop's Unsharp Mask filter generally offers more control and, when properly used, yields higher-quality results — it's one operation that's best done postscan in Photoshop. But the controls are somewhat puzzling, and the manual isn't a great deal of help.

Unsharp masking works by increasing the contrast between adjacent pixels where they represent an edge. This increases the apparent sharpness of the image. The Unsharp Mask filter allows you to set three parameters: Amount controls the intensity of the filter, Radius controls how far the filter will look around each pixel as it evaluates it, and Threshold sets the minimum degree of difference between pixels at which the filter will operate. Essentially, Amount controls the amount of sharpness, Radius controls the size of the contrast halo the filter creates around edges, and

Threshold lets you prevent noisy areas from being sharpened.

The settings for Amount will vary depending on the content of the original image and the kind of output you're producing. For halftone output, settings somewhere between 100 and 250 percent usually produce good results. If you're producing continuous-tone output from a dye-sublimation printer or a film recorder, a more conservative number is usually in order, somewhere between 65 and 85 percent. For the Radius setting, a useful formula is 200 divided by (output size x output resolution). For a 3-inch wide, 233-ppi image, for example, a radius of 0.3 pixels works well $(200 / (3 \times 233) = 0.29)$. The setting for Threshold depends on the amount of noise your scanner produces and the amount of film grain visible in the scan — settings of 0 through 5 are generally the most useful. If you set the threshold much above 5, the filter's effect is much less obvious.

7. CONTROL SCANNER NOISE AND FILM GRAIN BY SHARPENING CHANNELS INDIVIDUALLY.

Unsharp Mask's Threshold setting is quite effective for controlling noise and film grain, but if you examine the individual channels of the image, you'll find that very often noise or grain is much more prevalent in one (usually the blue channel) than in the others. The green channel contains the most brightness information and also contains the least noise and grain. You can often obtain good results by sharpening the green channel, using the settings given in step 6; sharpening the red channel, using the same Radius and Threshold settings but a lower Amount setting; and leaving the blue channel unsharpened. If you find that the blue channel is particularly noisy, you may even want to apply the Despeckle filter to it.

But beware of creating color fringes along the edges. This tends to be more of a problem with high-resolution images that demand a larger Radius setting. In such cases, you may want to despeckle the noisy channel (more than once, if necessary) and then use a low Amount setting and the same Radius and Threshold settings as on the other channels.

Here's where it all comes together. Figures 7a, 7b, and 7c show what happens when we put these lessons into practice. Figure 7a shows our original scan — it's too dark and too red. Figure 7b shows the same image rescanned with curves that correct the tone and the color balance. Figure 7c shows our corrected scan after application of the Unsharp Mask filter.

figure 7a

figure 7b

figure 7c

Publishing with AppleScript

Streamline production — and trim costs — by using AppleScript to automate repetitive publishing tasks. BY BOB SCHAFFEL AND CHUCK WEGER

AppleScript, which has been called the "sleeper product of the year," has the potential to dramatically reduce the time and effort necessary to prepare page-layout and graphics files.

What can be done with scripting? Plenty. Any routines performed the same way each time, such as placing images into picture boxes, checking for included fonts or graphics, and copying finished files to an archive — the kinds of tasks that depend on explicit rules — can be scripted. Instead of writing a list of instructions on paper for a coworker to perform such tasks manually, you write an AppleScript script for the Mac.

Scripting can bring great rewards. The Gannett newspaper chain is building an editorial-management system for newsrooms that uses AppleScript to help build newspaper pages by coordinating calendar programs, databases, and word processors. A major office-products catalog company cut down its production cycle from six weeks to less than one week after writing scripts to automate placement of product pictures and descriptions on its pages.

AppleScript and Apple events (the enabling system-level technology) act like a glue that binds various applications together into mega-apps. A scriptable application, such as QuarkXPress, Claris' File-Maker, and Novell's WordPerfect, allows the script-writing mechanism to delve inside the program and operate it as though a user were picking from menus and dialog boxes with a mouse. This process sounds like a simple macro facility, but it's much more. For instance, a script can send objects from one application to other applications (even ones running on other Macs). These objects include all the basic building blocks of documents: characters, words, paragraphs, database fields and records, and picture and text boxes.

How do you get started scripting? Look at scripts others have created. The DTP forum on CompuServe (GO DTPFORUM) is one of the best places from which to download graphic-arts scripts. Also, read *The Complete AppleScript Handbook,* by Danny Goodman (Random House, 1993), and *The Tao of AppleScript,* by Derrick Schneider (Hayden Books, 1993).

A good collection of QuarkXPress scripts is Sal's AppleScript Snippets ($39), which can import images and then crop and scale them instantly, among other tasks. ScriptIt ($99) is a handy Quark XTension that manages and runs scripts from a palette inside QuarkXPress. It allows you to name text and picture boxes within QuarkXPress — very useful for automatically flowing in copy. Both Snippets and ScriptIt are available from XChange (800-788-7557 or 303-229-0620).

But what about applications that aren't scriptable or control panels (which generally do not support scripting)? Check out Prefab Player, from Prefab Software (617-628-9025), a $99 utility that runs in the background and makes many applications, DAs, and control panels scriptable. Like a player piano, Player mimics user input, choosing menu items and other things within a program, all while being driven by scripts.

Although Adobe Photoshop does not support scripting directly, DayStar Digital (404-967-2077) has a $199 product called PhotoMatic that automates such Photoshop functions as Crop, Image Size, Mode Change, and so on. PhotoMatic 1.0 provides AppleScript-like scripts for Photoshop, but the next version will fully support AppleScript.

One of the neatest things about AppleScript is its extensibility. Scripting Additions (similar to HyperCard XCMDs and Photoshop plug-ins) extend the language to allow control of the Chooser, networks, and other useful things. You can download Additions from most on-line services.

System 7.5 ships with AppleScript installed and includes a collection of scripts to help you get started. For those of us in graphic arts, it's useful right now. ▢

Bob Schaffel is technology director of the Professional Prepress Alliance, a trade organization of pioneering service providers. Chuck Weger is an independent consultant and publisher of the *Photoshop Monitor* newsletter.

What AppleScript Can Do

REMEMBER HOW ALL OF YOUR DOS friends used to kick sand in your face because you couldn't create batch files and use wildcard file-copying commands such as

```
COPY C:\LITHO*.* D:\ARCHIVE
```

For those who aren't DOS-aware, this line says, "Copy all the files on disk C whose names begin with LITHO into a directory (folder) named ARCHIVE on disk D." Well, brush that sand off, because with AppleScript we can do far-more-powerful things:

```
tell application "Finder" to du-
plicate every file of folder "Aldus
in Seattle" of disk "My first disk"
whose name contains "Merger" and
creation date is less than current
date to folder "Adobe in Mountain
View" of disk "My second disk"
```

This not only copies the specified files but it also permits multiple criteria for selecting them and allows real, human-readable folder and disk names. Yes, it's more verbose, but it does a lot more too.

MONITOR TRAFFIC BY SATELLITE
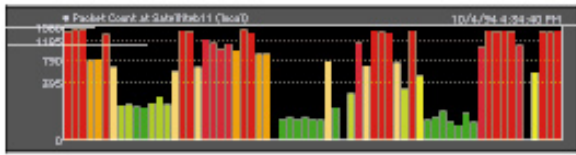
A SATELLITE THAT COLLECTS traffic data on your Ethernet network and notifies you of problems? Sure! It's Skyline/Satellite 1.0 ($795), from the AG Group (800-466-2447 or 510-937-7900). Skyline/Satellite consists of two tightly integrated pieces of software, one for archiving traffic data and the other for alarm triggering and traffic analysis.

The Satellite program, which runs in the background on any Mac, is a traffic-collection engine that compresses, indexes, and stores data about passing network traffic. The Skyline/Satellite package includes one copy of Satellite, which monitors one network segment and communicates with Skyline via Apple events. Extra copies of Satellite for additional network segments are available (5-pack, $1,195; 10-pack, $1,995).

Skyline makes the traffic data useful in two ways. First, it provides alert mechanisms — via dialog box, sound, or alphanumeric pager — for both high- and low-utilization threshold violations. Second, and more important, it lets you look back in time to analyze what was happening on your network both before and after a disaster occurred. You can scroll through historical data (utilization, bytes/second, and packets/second) to see what each node was doing at any time. You don't even need to understand protocol decoders — Skyline provides a graphical view of data.

Skyline/Satellite supports AppleTalk, IP, IPX, and NETBEUI/NETBIOS as well as other network protocols, making it well suited to use in mixed-platform, multiprotocol environments. / Mark Bieler

E-MAIL /
PowerTalking to Foreign Mail Systems

POWERTALK'S ROLE as a universal mailbox gets a big boost with two product upgrades and one new product from StarNine Technologies (510-649-4949). The three gateway-software products add new links from the PowerTalk mailbox to the Internet, Microsoft Mail, and standard e-mail directories.

Version 1.5 of Mail*Link Internet for PowerTalk ($49) lets PowerTalk automatically or manually connect to the Internet (via direct dial-up SLIP and PPP connections) and download Internet mail to a user's PowerTalk mailbox. The software runs on individual users' Macs and includes Mail*Link Monitor, a new utility that lets users view the status of the Internet link. Users who want the upgrade (normally $15) can get it for free by downloading it from ftp.starnine.com; the path is /pub/updates/pt-inet.

StarNine has also released a personal PowerTalk gateway to Microsoft Mail: Mail*Link MS for PowerTalk ($49 before January 1, $65 after; volume pricing also available). Similar to StarNine's Quick-Mail PowerTalk gateway, the new product links PowerTalk and Microsoft Mail on AppleTalk networks.

Also new is version 2.0 of Mail*Link Directory Services ($1,995 before January 1, $2,995 after; upgrade, $195), directory server software that links the address lists of various Mac, UNIX, and NetWare MHS mail systems. From within Microsoft Mail, QuickMail, and PowerTalk, users can now look up names in PowerShare catalogs and foreign directories, including X.500 directories. Version 2.0 also supports Apple's Thread Manager, which lets the server software process multiple client queries simultaneously. / JR

WORKGROUP SOFTWARE /
Network Mind-Melding

LOTUS ISN'T THE ONLY vendor trying to bring users together. DCA (800-348-3221) has begun shipping its Mac client software ($295) for OpenMind, a LAN bulletin board with similarities to PacerForum and Lotus Notes. Built around a shared database, OpenMind lets users share files, send messages, and hold electronic conferences. Unfortunately, DCA isn't all that open-minded about its server software ($995); it needs a PC running Microsoft Windows NT Server.

On the group-scheduling front, Mac-VONK (403-232-6545) has released a System 7.5-savvy version of its TeamAgenda group scheduler. Version 1.7 ($449 for 5 users) uses System 7.5's Drag and Drop technology to enable PowerTalk users to drag e-mail appointment requests directly into their schedules. Other new features include support for 120 users, QuickDraw GX printing, and the ability to display multiple schedules. / John Rizzo

LOCALTALK CONNECTORS /
PhoneNET Shrinks

EVEN SMALLER than earlier designs, the new Farallon PhoneNET Pocket Connector ($12.99; $19.99 for starter kit with two connectors and phone cable) hooks up any Mac, Newton, or LocalTalk-capable printer to a LocalTalk network. With Farallon's TwistFit technology, the Pocket Connector's DIN-8 plug can spin 90 degrees and fit easily into the ports of such products as the HP DeskWriter, the IIsi, and the Newton. 510-814-5000. / Nancy Peterson

Savvy Small-Office Networking

Working with consultants may be the best way to build a cross-platform network for a small business — if you're network-savvy enough to keep them from selling you more than you need. BY JOHN RIZZO

THERE ARE TWO WAYS to do just about anything: Do it yourself, or get help from an expert. Given the breadth of knowledge required to mesh Macs and PCs on a network, it's often practical to opt for consulting an expert. In the case of a large organization, this expert is generally someone in the IS department. For a small business, it's usually a private consultant.

An outside network specialist can most likely design and set up a smoothly functioning network much more quickly than you could. Some consultants also offer one-stop shopping, selling you all the hardware, software, and services you need. In addition, you can choose someone well suited to the task of creating a cross-platform network — an expert in both Mac and PC technology.

Be wary, however, of the consultant who insists you don't need to know the nasty details. You do need to know all the options, because what's best for the consultant may not necessarily be what's best for your business. You don't want to end up spending more than you need to for a network that doesn't meet all of your needs.

Working with a consultant will go much more smoothly if you have a basic understanding of the issues involved in the major decisions you'll need to make. This column provides tips to help you make these decisions wisely — and also tells you about some money-saving products from small companies that your consultant may not know about.

In-Wall Versus Exterior Wires

If you're starting your network from scratch, the most basic decision you'll need to make with your consultant is where to put the network cables — inside or outside the walls. The key to making this crucial decision lies in the number of Macs and PCs you want to connect.

A good rule of thumb is to go with interior wiring if you're connecting eight or more computers; it's more expensive to install, but it will save you a lot of hassles. Exterior cables aren't practical for more than about eight computers, because it's too easy to step on the cables that crisscross the floor and break the wires inside. And no, you shouldn't try to get around this problem by running network cables above dropped-ceiling tiles — electromagnetic interference from fluorescent lights slows down a network.

LocalTalk Versus Ethernet

A trickier decision is whether to use LocalTalk or Ethernet as the transmission protocol and media (in simplified terms, the communications language and the associated type of wiring) that connect your computers.

For mixed Mac and PC networks, most consultants recommend Ethernet, which runs about four to five times as fast as LocalTalk. If you expect to be frequently transferring large files over the network, Ethernet is definitely the way to go. If data-transfer speed isn't crucial, though, you may well want to base your decision on cost — which depends partly on which types of connectivity are already built in to your computers.

Ethernet connectivity is built in to most modern Macs and PCs, and you can add it to older models for about $100 to $200 per machine. However, since LocalTalk has been built in to all Macs since 1986, it's cheaper than Ethernet if you have a lot of non-Ethernet Macs and few PCs. LocalTalk is not such a good idea if you have a lot of PCs, though, since you'll need to get LocalTalk add-in cards or get LocalTalk connectors for the PCs' parallel ports. The connectors are easier to deal with; they're available for less than $200 per node from Coactive Computing (800-727-4273 or 408-774-3540) and Apexx Technology (800-767-4858 or 208-336-9400).
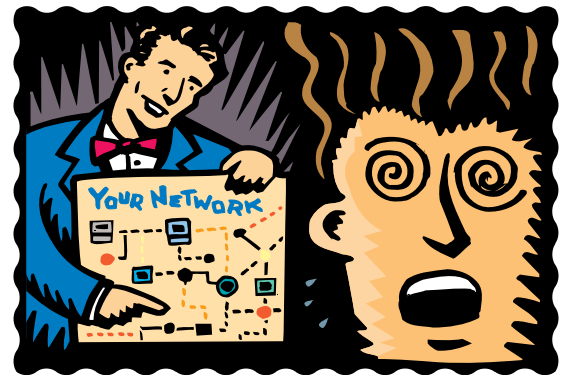
In considering the cost of LocalTalk versus the cost of Ethernet, you should make sure your consultant knows about some of the less expensive ways to implement Ethernet wiring. True, LocalTalk cable, which uses RJ-11 phone jacks and two pairs of wire, generally costs less than in-wall 10BASE-T Ethernet cable, which uses bigger, RJ-44 jacks and four pairs of wire (two other, sturdier, types of Ethernet cable, thinnet and thicknet, are even more expensive than 10BASE-T and are probably overkill for a small business). However, there are some alternatives to standard, in-wall Ethernet wiring.

For instance, you may be able to save thousands of dollars in rewiring costs for in-wall Ethernet by making use of existing in-wall cables. Ask your consultant about alternatives to rewiring, such as using two sets of existing LocalTalk or phone cables (with two pairs of wires per cable) for a single Ethernet line with four pairs of wires. Another alternative is to use Silver Streak ($99 per node and up), from Tut Systems (800-998-4888 or 510-682-6510); it consists of a set of connectors and converters for Macs and PCs that lets you run Ethernet

over in-wall LocalTalk cables and RJ-11 jacks as well as over the flat silver-satin phone cord used for external LocalTalk (see review, November '94, page 51). Silver Streak can support as many as 30 computers on a network segment. However, be warned that Silver Streak networks are not autoterminated; when you disconnect two computers in a line of connected ones, the entire network goes down.

Another family of nontraditional Ethernet products is EtherWave ($129 per node and up), from Farallon (800-995-7760 or 510-814-5000). Like Silver Streak, the EtherWave products let you string computers together in a daisy-chaining manner; unlike Silver Streak, though, EtherWave uses 10BASE-T wiring and autoterminated devices, so a disconnection won't bring the network down. EtherWave is a good choice for creating small, ad hoc networks (fewer than eight computers and printers) and for extending existing 10BASE-T networks.

Which File-Sharing Method?

Once you've got your basic cabling situation figured out, it's time to decide how you'll implement the major cross-platform feature of your network: file sharing. Just hooking your Macs and PCs together doesn't necessarily provide you with the file-sharing capabilities you need. Basically, you have two main options: basing your network on AppleTalk, so that Macs and

DECIDING WHAT YOUR NETWORK NEEDS

Cabling

Start → Existing separate Mac and PC networks? —no→ Existing in-wall wiring? —no→ More than eight computers? —no→ Use external wiring.

yes ↓   yes ↓   yes ↓ Install in-wall wiring.

LocalTalk versus Ethernet

Most Macs have built-in Ethernet? —no→ Large-file transfer or network speed important? —no→ A lot of PCs? —no→ LocalTalk.

yes ↓   yes ↓   yes ↓

Ethernet.

File servers

Large-file transfer between Macs and PCs? —no→ Add a gateway.

Large-file transfer between Macs and PCs? —no→ Use peer-to-peer system, such as System 7 file sharing and Personal MACLAN Connect or Timbuktu.

yes ↓   yes ↓

Add a server that Macs as well as PCs can access.

Low cost and ease of maintenance more important than speed? —no→ PC-based server with software such as Windows NT Server.

yes ↓

AppleShare on Mac server; PC clients use Timbuktu, COPSTalk, or upcoming version of AppleTalk for PCs.

PCs communicate peer to peer as Macs do with System 7 file sharing, or maintaining PC-based network software for your PCs and connecting the Mac and PC subnetworks with a gateway or a cross-platform file server.

The advantage of basing your network on AppleTalk is that you can create simple, easy-to-maintain networks that don't require gateways. By the way, don't be misled by consultants with PC backgrounds who think AppleTalk and LocalTalk are one and the same. AppleTalk is a set of networking specifications that prescribe how Macs share information on a local-area network over LocalTalk *or* Ethernet media; naturally, AppleTalk is built in to all Macs. You can add it to PCs with products such as the Coactive Connector (which has built-in AppleTalk software); Personal MACLAN Connect, from Miramar (800-862-2526 or 805-966-2432); Farallon's Timbuktu for Windows; and COPSTalk for Windows, from COPS (404-840-0810); each of these products is in the range of $100 to $200 per node. Apple is slated to release AppleTalk software for PCs by December 1994. These products enable PCs to use Mac printers and share files with Macs via System 7's built-in file sharing.

If, on the other hand, your PCs use non-AppleTalk, PC-based network software — such as Microsoft Windows for Workgroups or Artisoft's LANtastic — you may well require a gateway. Either that or you can opt for a higher-performance alternative to a gateway: a file server that can be accessed by Macs as well as PCs. The cheapest and easiest-to-maintain file server is a Mac running AppleShare, which should support PCs by December 1994. Using a PC running Windows NT Server is another option; the software requires a fast PC with lots of RAM and hard-disk space, but the server is fairly easy to maintain.

Consultants who also happen to be authorized NetWare dealers may be eager to sell you Novell NetWare, a high-end network operating system with file-server capabilities that is used frequently on large networks. NetWare is a complicated system that requires a trained technician to maintain. Unless you really need NetWare's top-notch data protection, speed, and connectivity to other networks, you should look toward other options for a small business.

Don't Worry, Be Active

If you hired a contractor to remodel your house, you'd give a lot more direction than "build me a new kitchen." The same is true when it comes to building a new network.

Take an active role in the planning of your office network, from choosing a cabling setup to selecting the best file-sharing system for your needs. You'll sleep better knowing what's gone into the network, and you still get to watch the consultant do the grunt work: installing cables and setting up servers. On top of all that, you may even save some money!

MacUser technical editor John Rizzo is the author of *MacUser Guide to Connectivity* and *How Macs Work* (Ziff-Davis Press).
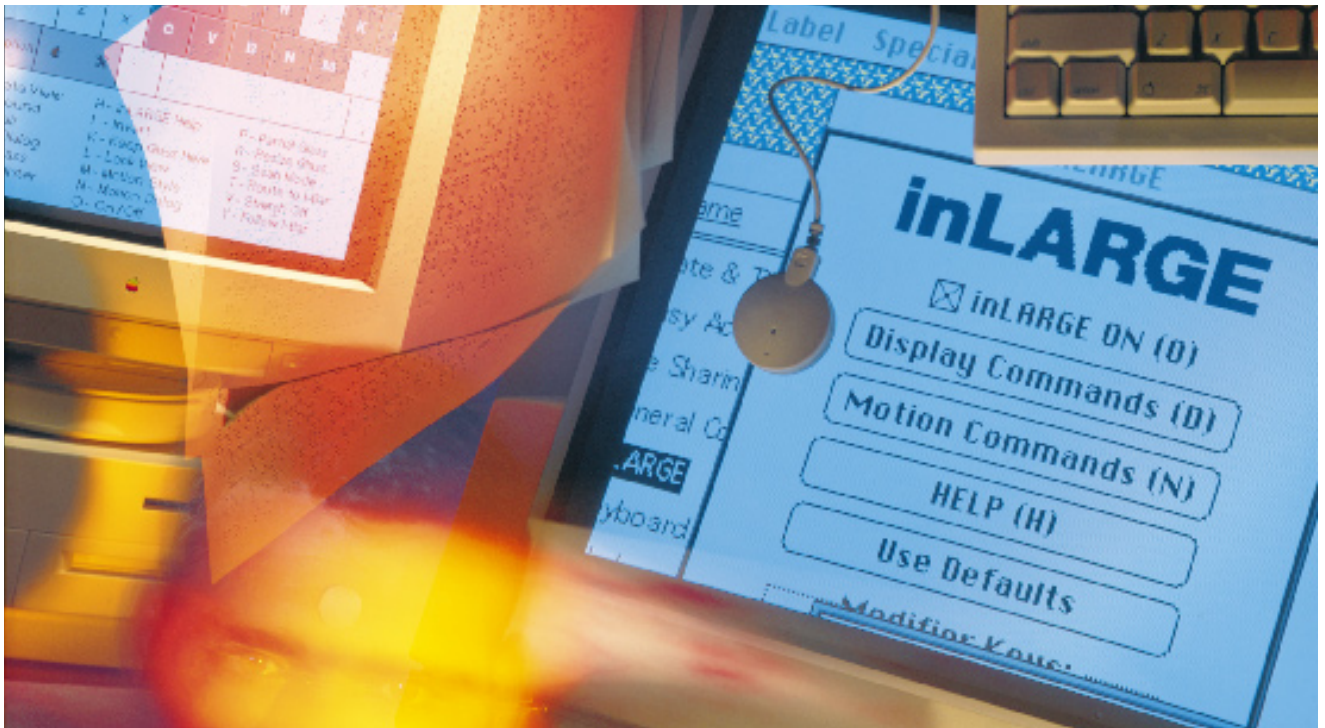
The Easy-Access Mac

Making the Macintosh accessible to people with disabilities is easier — and less expensive — than you may think. BY JOE CLARK

S URE, THE MACINTOSH IS easy to use and powerful, but some people with disabilities can face barriers in putting that power to use. How, for example, do blind people navigate the Macintosh's graphical interface? How do quadriplegics create a spreadsheet? How useful are multimedia CD-ROMs to those people who are hard of hearing?

Questions such as these are coming up more and more in the U.S. in the wake of the passage of the Americans with Disabilities Act, which requires most employers to "accommodate" disabled employees. With limited exceptions, it is illegal to fire, refuse to hire or promote, or otherwise discriminate against qualified employees because they have disabilities. Instead — again with limited exceptions — employers are required to adapt the work environment, or the job, to meet disabled employees' needs.

The good news is that making the Macintosh accessible is relatively easy and inexpensive; in almost every case, you can employ off-the-shelf Macs with a few specialized accessories. Here's a rundown on the latest in *adaptive technology* as well as pointers to help you decide what products you need.

Talk It Over

By far the most important step is to talk with the disabled employees about their requirements. What impact, if any, does a particular disability have on using a computer? For example, single-leg amputees may require no computer modifications at all, whereas people with repetitive-stress injuries (RSI), such as carpal-tunnel syndrome, may need a new method of entering text. Paraplegics may simply need to raise their desk a bit farther off the floor so a wheelchair can fit under it, and people with low vision may need screen magnification and speech output.

Once a disabled person's needs have been established, the next step is to find the right products to fill those needs.

Mobility Impairment

Those whose disability affects their arms and hands — for instance, those with cerebral palsy, muscular dystrophy, or RSI — probably need software or hardware that alters the way they can enter information into the Macintosh.

The least expensive solution, although a

bare-bones one, is to use Easy Access, a control panel that comes with the Mac. It lets you lock down modifier keys (Shift, Control, Option, and Command) on any keyboard, so you can press keys in sequence instead of simultaneously — for example, to print you press the Command key, release it, and then press P.

A more extensive solution is to install an on-screen keyboard, such as ScreenDoors ($395), from Madenta Communications (800-661-8406 or 403-450-8926), or Ke:nx (pronounced *connects;* $780), by Don Johnston (800-999-4660 or 708-526-2682). Anyone who can use a mouse or trackball can use such a keyboard by pointing and clicking. Typing via an on-screen keyboard is usually faster if you also use word-prediction software (see figure 1), such as Madenta's Telepathic ($325).

One-handed typing is possible with Half-QWERTY ($139.95), from Matias (416-749-3124). This software maps half the keys on a keyboard to their mirror images on the other half when you hold down the space bar.

For people with severely impaired mobility, limited to, say, pressing a single switch, you can get software that sequentially highlights on-screen elements, such as scroll bars, close boxes, icons, or keys of an on-screen keyboard. In order to perform an action, such as closing a dialog box, all a user has to do is activate the switch when the desired item is highlighted. Madenta's RevolvingDoors ($395) and Ke:nx each perform this highlighting action.

Those who have no motor use of their hands or arms may be able to make use of a speech-input product, such as PowerSecretary ($2,495), from Articulate Systems (617-935-5656). This software takes dictation; it enters the words you speak into documents on the Mac.

If head movement is a better option than talking, try a head-mounted device such as the HeadMaster ($595), from Prentke Romich (800-262-1984 or 216-262-1984), or the HeadMouse ($1,995), from Origin Instruments (214-606-8740). The HeadMaster has a sensor you can mount anywhere on your Mac that picks up the movement of light from a light pen strapped to your head. It translates the movement of the light into mouse movement. The HeadMouse is a newer and much less intrusive device that requires you to wear a tiny reflective dot on your forehead; twin infrared beams from a sensor triangulate on the
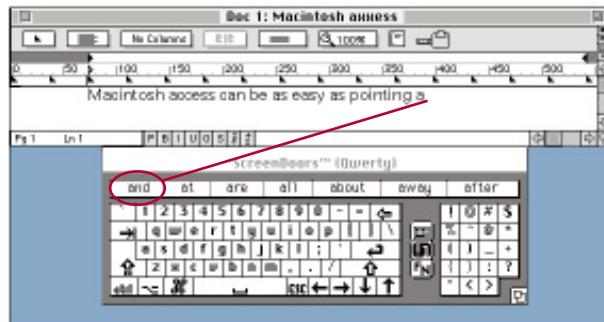
figure 1 / **Word-prediction software** enhances and is usually sold with on-screen keyboards. Here, Madenta's software Telepathic predicts the next word in the document and displays choices within the on-screen keyboard ScreenDoors.

dot's motion and move the cursor accordingly (see figure 2).

With either product, consider adding Madenta's Magic Cursor ($195), which lets you click, double-click, and drag simply by holding the cursor still for a moment and flicking it slightly to signal the action you want the Mac to take (see figure 3).

Visual Impairment

For people who have vision loss severe enough to make it difficult to see and navigate the Mac's graphical interface, there are several aids, ranging from image enlargement to Mac speech.

For people with moderate visual impairment, consider image-enlargement software, which magnifies the screen image to

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Outstanding Stand-Alones

IN SOME INSTANCES, instead of buying hardware to outfit the Mac for the disabled, the best measure is to buy a stand-alone product.

For the visually impaired, reading documents not already entered into the computer is tricky. You can use a scanner and OCR software to get many documents' text into readable electronic form, but for documents that are hard to scan, such as expense vouchers or spreadsheets, OCR may fall short. It may be more practical to use a stand-alone reader. Xerox/Kurzweil (800-421-7323 or 508-977-2000) and Arkenstone (800-444-4443 or 408-752-2200) make readers that can turn written text into spoken words.

The telephone can be an obstacle for the deaf and hard-of-hearing. Until recently, you could get a special modem for the Mac that let users type back and forth in real time. Unfortunately, the maker of that modem, Dove Computer, went out of business. If you need

The PortaView PV20 is a text telephone from International Krown Technologies.

such a product, you will have to turn to stand-alone modem/keyboard/display units known as TDDs (telephone devices for the deaf), TTYs (teletypewriters), or TTs (text telephones). They cost $200 to $600 and are available from such vendors as Ultratec (800-482-2424 or 608-238-5400), Harris Communications (800-825-6758 or 612-946-0921), and PhoneTTY (201-489-7889).

If your company makes instructional videos for in-house use or distribution, consider having them captioned for the hearing-impaired. The Caption Center (617-492-9225) does good work. Unless they have a MacTV, Quadra, Performa, or LC 630, those who view captioned videos will need stand-alone decoders to read them. They cost $100 to $200 and are available from National Captioning Institute dealers (800-533-9673 or 703-998-2400) and Pacific Lotus Technology (800-243-2710 or 206-454-7374).
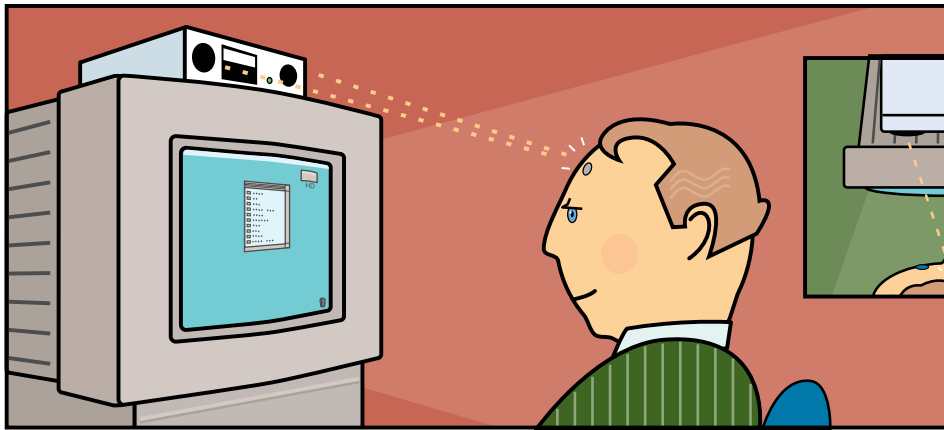
make it easier to read. CloseView, which comes with Mac system software, may do the trick, and it's worth trying first, since it is free. inLARGE ($195), from Berkeley Systems (510-540-5535), provides more-sophisticated features — for instance, it can move a line of text across the screen for you rather than requiring you to move the cursor or your eye.

A large-screen monitor may be a necessity, not a luxury, for visually impaired people who need to see enlarged images. But it might not be as expensive as you think — since some visually impaired people find an enlarged black-and-white image easier to read than a color one, you may be able to opt for a relatively inexpensive, monochrome screen.

For those with total or near-total vision loss, you need speech output. Berkeley Systems' outSPOKEN ($495) provides spoken descriptions of icons, menus, windows, and other aspects of the Mac interface. outSPOKEN can also help make printed documents accessible to visually impaired users; if they scan the documents and use OCR to recognize the text, they can have outSPOKEN read it aloud.

Users who read Braille can print any document if they use Braille-translation software, such as Duxbury Braille Translator ($495), from Duxbury Systems (508-486-9766), and a Braille printer, such as the VersaPoint ($3,695), from TeleSensory (800-227-8418 or 415-960-0920).

Hearing Impairment

Some deaf and hard-of-hearing people may miss the auditory information that's part of many Macintosh applications, from error beeps to the sound track of a QuickTime

movie or a multimedia CD-ROM.

To make error beeps visual rather than auditory, simply open the Sound control panel and turn the speaker volume to zero. This causes the menu bar to flash, which is known as a *visible beep.*

Using QuickTime is a more difficult matter. Multimedia is such a new concept that accessibility issues are not widely recognized. QuickTime does provide tracks in which you can store captions, but it's up to QuickTime authors to learn the exacting art of captioning and actually include captions. Few, if any, QuickTime movies are captioned.

Learning Disability

People who find it difficult to process written language and other visual information can use many of the same products used for other disabilities that make entering and interpreting information easier.

Word-prediction software, such as Madenta's Telepathic, and speech-input software, such as Articulate Systems' PowerSecretary, can enable such users to enter text more easily. Speech output, of the sort available in AV Macs, can aid in proofreading. People with relatively severe learning disabilities may find Berkeley Systems' outSPOKEN useful for navigating the Mac interface.

Getting More Information

Adaptive technology is improving and changing as fast as other technological realms. One way to keep up is to subscribe to the Co-Net CD-ROM series ($50), from the University of Wisconsin (608-263-2309). Twice a year, you get a disc containing an immense database of adaptive-

technology products along with relevant documents, such as the full text of the Americans with Disabilities Act.

Apple Computer's Worldwide Disability Solutions Group (800-776-2333 or 408-996-1010) can offer advice, and Apple's Aisle 17 (800-600-7808) mail-order operation is an easy way to order adaptive products (and entire computer systems to run them on) if you already know what you want.

With the products and sources mentioned here, you can make Macs accessible to *everyone* in your office, at a reasonable cost — especially compared to the cost of not hiring talented disabled people. ⌘

Toronto writer Joe Clark never unlawfully parks in handicapped spots.
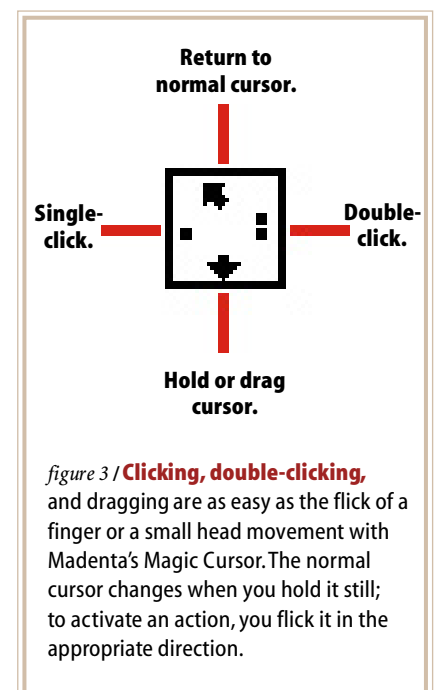
ILLUSTRATION / LIN WILSON

Rundown on Batteries

Think you've got this battery thing all figured out because you're a great power conservationist? Think again. It's time to get hip to the best strategies for maximizing your battery power. BY SHARON ZARDETTO AKER

YOU THINK SIZE is the biggest difference between a desktop Mac and a PowerBook? Wrong. The single most important differentiating factor between these two animals is the power source. Fortunately, you don't have to know about volts and ampere hours or carry around a voltmeter in order to get the most out of your battery. A few important tips about recharging, reconditioning, buying, and maintaining batteries can take you a long way — just read on.

Is Your Battery Dying?

Let's start by dispelling the most subtle myth of all: that rechargeable batteries are immortal. They most definitely aren't. A rechargeable battery has a life span measured in *cycles:* A 500-cycle battery, such as those sold by Apple and some third parties, can be used (depleted) and recharged about 500 times before it no longer takes a charge. If you recharge your battery about three times a week, it will have a life span of about three years — which means that all those original PowerBook batteries are about to hit the obit columns. If your battery's not giving you much in the way of run time even after you've tried all the "refreshing" techniques

mentioned here, it's likely there's nothing you can do but dispose of it properly and then buy a new one.

Reconditioning NiCds

NiCd batteries — the ones used in all-in-one 100-series PowerBooks — need to be reconditioned regularly for best performance. Reconditioning means running down the charge as far as is safely possible before recharging it, instead of just topping it off from a partially charged state. The best way to discharge a battery is to use a battery reconditioner/recharger such as the ones available from Lind Electronics (800-659-5956 or 612-927-6303; prices start at approximately $60); they run the charge down to 1 volt in each battery cell, which is what you need for an ideal reconditioning. Your second-best option is to use a utility such as PBTools ($99.95), from VST Systems (508-287-4600), or Jeremy Kezer's $10 shareware BatteryAmnesia (available on-line; see end of article); they perform a *deep discharge* that depletes the battery beyond the point at which the PowerBook would normally shut down due to a low charge but not as far down as 1 volt. If you don't have a battery-management utility, run the PowerBook
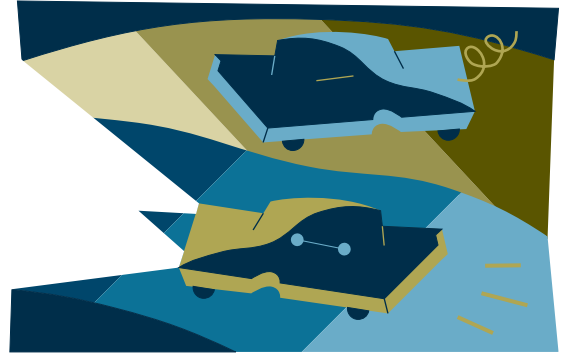
until it shuts itself off for lack of battery power.

What difference does reconditioning make? Here's one quick example: My poor PowerBook 170 remained tethered to its desk for about two months, since I was similarly tethered finishing up a book project. It was unplugged for only a few hours a day, when the adapter was charging another PowerBook, but often the 170 wasn't in use even during that downtime. The battery was being treated in the worst way possible: depleted a little, recharged, depleted a little, recharged again — and often the recharges weren't complete. I finally charged the battery completely overnight and tested how long it lasted the next day: 1 hour, 40 minutes of battery-draining activity. A few days later, I used PBTools to do a

POWERBOOK SECRETS / *battery dos and don'ts*

BESIDES THE THREE KEY dos discussed in this column — reconditioning NiCd batteries regularly, charging internal as well as external batteries fully, and resetting the Power Manager as needed — here are a few more dos and don'ts to follow if you want to make the best use of your batteries:

DON'T treat batteries carelessly; they're made of toxic materials and must be disposed of properly. Most batteries can be returned to the manufacturer; you can return Apple batteries to a dealer for recycling.

DON'T leave a battery charging for weeks at a time — that's a sure way to reduce its life. Unplug it once in a while, and exercise those cells!

DON'T panic right away if you can't wake your PowerBook when it's plugged in. A drastically run-down battery may need to charge for 20 minutes or so before your PowerBook comes back to life.

DO routinely exchange the positions of the batteries in a 500-

series PowerBook; the left battery invariably depletes first.

DON'T leave the 100's lead-acid battery uncharged after a shutdown due to battery draining. If you leave it uncharged for too long, you may not be able to recharge it at all.

DO carry your battery in some sort of case — even a sock will do — to prevent it from shorting. An errant paper clip or similar object may be enough to cause a short if it comes into contact with the exposed terminals of a loose internal battery.

DON'T assume that your battery is dead if it's not charging. The problem may be the power adapter or even the outlet the adapter's plugged in to. Or — if the PowerBook runs only when it's plugged in and the battery refuses to charge while it's in the PowerBook — you may have a blown fuse on the motherboard; check with your dealer.

deep discharge of the battery and charged it overnight again. The next day, it lasted 2 hours, 20 minutes through the same test — an extra 40 minutes!

But here's an important note about discharging the battery: Don't do it too often (Apple recommends once a month), and do it only when the battery charge is quite low anyway. Why? Because if you take an 80-percent-charged battery and discharge it, you're wasting all that power; it has a finite number of cycles, and you're spending power on the discharge instead of on use.

Add-on Power

If you're looking for a few extra hours of battery power, get a lightweight external battery. The ground-breaking VST ThinPack was the first in this field, and the highly similar Mini 3 offering from Technöggin (800-305-7936 or 513-321-1777) has made major inroads into the market; BTI (213-728-7874), the first third party to offer internal batteries for PowerBooks, has also joined the fray. Which should you get? Talking to these companies about their own and their competitors' products is an adventure in technospeak; each representative is absolutely sincere and, no doubt, truthful, but about the only thing they agree on is the

figure 1 / **VST Systems' PBTools** tracks battery usage graphically, so you can see how far your battery charges and how fast it discharges.

weight of each other's batteries. Charge time? Run time? Depends on whom you ask. And if you start talking about whose charging circuitry is more sophisticated . . . .

But let's face it: You don't care about the charging circuitry — you care about the results as shown in charging and run times. Let's take the best-case scenario based on each manufacturer's claims and, for comparison purposes, take a look at the external batteries available for the 100-series PowerBooks (each also provides models for

the Duos and for 500-series PowerBooks). That leaves all the batteries charging in the same amount of time and lasting just about equally long too. So, here's what you're left with: The BTI SlimPack weighs 2.5 pounds and comes with Connectix PowerBook Utilities (CPU), for about $170; Technöggin's Mini 3 weighs 1.7 pounds and comes with CPU, also for about $170; VST's Thin-Pack weighs 1.5 pounds and comes with PBTools, for about $130. Street pricing can vary, of course, but list price and weight seem like strong arguments for getting the ThinPack, unless you're hankering for CPU; personally, I prefer PBTools.

By the way, don't be misled by the rumor that a VST battery can overcharge if you leave it plugged in. That rumor got started because of a misunderstanding about the battery-cell manufacturer's specifications that resulted in an incorrect warning in VST's original documentation. VST and Technöggin use the same cells from the same manufacturer, and there's no danger of overcharging in either case.

In the slightly bigger category, there's Technöggin's 3x external battery, which weighs 2.5 pounds and delivers *exactly the same* amount of power as the Mini 3. Why would you carry the extra weight for no extra power? I wouldn't. But fellow *MacUser* columnist Bob LeVitus does, because he likes the way the 3x *looks* in its classy Power-Book-matching case, and lugging an extra pound doesn't bother a big guy like him. In the even-a-little-bigger category, there's VST's 3-pound ThinPack Plus at $259 versus Technöggin's 4-pound 5x model at $300; they deliver similar amounts of power, so again, your main concerns will be price and weight.

If weight isn't an issue, you can get 5 to 6 hours of use quite inexpensively with the 5-pound $99 Lind APP-2. For greater needs and bigger budgets, the new 6-pound Energy Power 220, from AER Energy Resources (800-769-3720 or 404-433-2127), uses zinc-air-cell technology to provide as much as 25 hours of power, for about $650. (These are manufacturers' claims; your mileage, of course, may vary.)

If you use any external battery with any PowerBook model, remember this: You

have to fully charge the external *and* the internal batteries to get the best run time. Running a PowerBook on two batteries is not a simple additive process; the batteries last longer when they are as full as possible and are evenly depleted during use.

The Search for 100 Batteries

Pity the poor PowerBook 100 users, who sacrifice speed, screen, and internal floppy drive for the pleasure of a truly lightweight laptop. Through PowerBook revisions (and some disdainful looks from the "power" PowerBook users), they've kept the faith. And then what? A few years into the life of the computer — less time even than the IRS' allowable depreciation — no batteries are available. The batteries that came with the machine or that were purchased shortly thereafter have reached the end of their usefulness; Apple-brand models, if you can find any, may have been sitting on the shelf for years and can't be expected to perform decently. Who ya gonna call? BTI has created a new 100 battery called the MC-100 ($59.95) by repackaging a subset of the cells in its SlimPack external battery. The firm's tests show a run time of 1 to 1.25 hours (most people got 2.5 to 3 hours from Apple's original batteries). The brand-new one we tested lasted only 30 minutes under heavy use, however, as did the second one we ordered to verify our results. Half an hour isn't much — but it's better than no battery at all, and you can use the MC-100 in tandem with an external battery.

But maybe there's life in that old gray pack of cells yet. Rich Wolfson, who usually writes the sidebar for this column, had an old 100 battery that was giving him only *20 minutes* of power, no matter how well he treated it. Then he reset the Power Manager chip (see the "PowerBook Secrets" sidebar, December '94, page 147) by removing the internal and the backup batteries and then pressing the reset and the interrupt buttons simultaneously for 10 seconds. Guess what? That battery now lasts 1.5 hours. ⌨

Sharon Zardetto Aker's latest book, *The Mac Almanac*, was recently released by Ziff-Davis Press, even though she swore she'd never write another big book after *The Macintosh Bible*.

You can find BatteryAmnesia in the MacUser and ZiffNet/Mac areas on CompuServe and eWorld. See page 4 for details on how to access ZiffNet/Mac.

Help Folder

Conquer the unbootable hard drive, get your Power Mac to run more software, and waste no time getting on to the Internet. BY ANDY IHNATKO AND BOB LEVITUS / TIPS COMPILED BY CHRISTOPHER BREEN

Booting the Unbootable

Q. I'm about ready to put a chair through my screen. I was installing System 7.5 when my dad cut off the power, looking for a busted fuse. Now, my Mac tries to start up but crashes midway through. It won't start up from either a floppy disk or from my external drive. What should I do (to the Mac, not to my dad)?

John St. Vincent
Vancouver, BC, Canada

ANDY: Aw, ease up on your dad. The guy bought you a whole Mac system and will probably blow $100,000 on your education, and you're on his case for performing maintenance on the house that shelters you? The youth of today. It breaks my heart.

If the Mac can't boot from its internal drive, it's supposed to lunge straight for the next bootable device on the chain. In your case, the problem is that the installation gets far enough along that your Mac thinks the drive is perfectly bootable, thank you very much, so it ignores all other devices. Ignoring the floppy drive is exceedingly rare but does happen. (It probably means there's a hardware problem.)

Fortunately, there is an out for this situation: Hold down the Command, Option, Shift, and Delete keys simultaneously while booting. That tells the Mac to ignore the

Write to Help Folder/Tips

c/o *MacUser*
950 Tower Lane
18th Floor
Foster City, CA 94404
Don't want to wait for an answer? Post your question on ZiffNet/Mac, *MacUser*'s on-line service, and get a reply from Bob (76004, 2076) or Andy (72511,204). We pay $25 – $100 for any undocumented tips we publish. Send them to Christopher Breen (72241,1036).

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*. . . BUT WERE AFRAID TO ASK

Q. How do I put my own programs and documents into System 7.5's Launcher?
Molly Volley
Santa Rosa, CA

ANDY: Quite simple — just drag the desired application and document icons (or aliases) into the Launcher Items folder, inside the System Folder.

"Hey," you might exclaim, "that's unnecessarily complicated. Why doesn't the Launcher let you just drag an icon from the Finder right into its window or at least give you a menu option for installing new apps and docs?" To that I say, "Pish-tosh!" After all, it's not as if the Launcher was designed to make the Mac easier for inexperienced people to use.

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internal drive when booting and should solve your problem.

BOB: Here's a handy acronym to remind you of that key sequence — just remember that your Mac needs a doctor or several DOCS (Delete-Option-Command-Shift).

Into the Internet

Q. How do I get a subscription to the Internet? I've read enough articles on it to want to give it a try, but I don't know how to get started.

Joe Catlin
via CompuServe

ANDY: You're in luck. *MacUser* just covered that very topic just last month ("Shopping for Internet Access," December '94, page 133). Take a gander at that for the basics on how to sign on to the Net.

To summarize and add my own two humble cents, one of the first steps in getting on the Net is finding a service provider, an organization that, for a fee, lets you log on to its computers to access the Internet. To get a regularly updated list of Internet service providers from coast to coast, simply hop on to ZiffNet/Mac and download NIXPUB.SIT. Similar lists are available from other on-line services as well as user groups and bulletin boards.

It is possible to access the Internet via a commercial service, such as America Online or CompuServe. But unless all you want to do is exchange mail or receive electronic magazines, it's almost always a horrible deal. Why pay a wheelbarrow of dough to such an organization when others can offer you a broader range of services — access to remote bulletin boards and file libraries, for example — for just a buck or two an hour? Be sure to get the lowdown from others in your area about what the various service providers offer, and think twice about using commercial services for surfing the Net.

BOB: My advice is to try the Internet via America Online first. Sure, it's more expensive and AOL's interface leaves a lot to be desired, but if you're among the many who have discovered that the information superhighway is vastly overrated, you'll save countless hours of troubleshooting your Internet connection and bypass dickering with a service provider who still thinks a Mac is a hamburger.

Michael Fraase's *Internet Tour Guide* (Chapel Hill, NC: Ventana Press, 1993) is a good resource if you decide you do want to set up a connection, but the simplest method is to take a test drive via America Online.

ANDY: Another useful book with all of the

information and software you need in order to get on the Net is Adam Engst's *Internet Starter Kit* (Indianapolis: Hayden Books, 1994).

Uncooperative Coprocessor

Q. I need to use the math coprocessor on my Power Mac 6100 to run certain software. But the Power Mac won't run the coprocessor in 680x0 emulation mode. Why not, and how can I get the software to work?

Jordi Fabara
Guayaquil, Ecuador

BOB: The reason the software won't run is because the 680x0 emulator, the part of your Power Mac that lets it run non-native Mac software, emulates the 68LC040 chip, which doesn't have a math coprocessor.

There is a piece of software, Software FPU, that might save your bacon. It emulates a math coprocessor, making your application think it has access to one. It's reported to work with many, although not all, applications. To get a copy of the Power Mac version, send $20 to John Neil & Associates, P.O. Box 2156, Cupertino, CA 95015. The 680x0 version (for Macs that use the 68LC040 chip) is shareware and can be found in all the usual on-line places.

Font Conflicts

Q. When I loaded some new font collections onto my Mac, the fonts in my copy of Reader Rabbit went out to lunch: The letters a child enters into the program aren't what comes out. For instance, a *t* might come out as an accented *e*. I could delete the font we're having trouble with, but how do I know another font won't just step in and steal the scene as well?

John Seniura
via the Internet

BOB: Sounds like a font-ID conflict or a corrupted font to me. The cure is the same for either problem.
1. Remove all of your screen and TrueType fonts. (If you're running System 7.0, they're in the System file; if you're running System 7.1 or later, they're in the Fonts folder).
2. Reinstall one font, by dragging it onto the System Folder's icon.
3. Enter words into Reader Rabbit.

Repeat steps 2 and 3 until Reader Rabbit freaks out. Then remove the font you reinstalled last, and your troubles will be gone. If throwing out fonts is not a satisfactory

solution, you will need a font-management utility, such as Suitcase ($79), from Symantec (800-441-7234 or 503-334-6054). Suitcase resolves font conflicts automatically and renumbers or renames conflicting fonts so you can use them again.

Converting PC Graphics

Q. Do you know of any programs that will let me convert PC graphics so I can use them on my Mac?

Chris Faria
APO, USA

BOB: The readers asking questions this month must be mind readers — an in-depth answer to this question is in last month's Mac to PC section ("Finessing File Translation," December '94, page 139). For the long answer, check out that article.

The simple answer is that you should get DeBabelizer Toolbox ($399) or DeBabelizer Lite ($129), from Equilibrium Technologies (800-524-8651 or 415-332-4343).

Both DeBabelizers — regular and lite — can convert files from and to more than 40 formats, including EPS, Photoshop, PICT, and TIFF. The big guy is scriptable and can

do batch processing of feats such as palette adjustment and conversion, dithering, and application of Photoshop plug-in filters.

ANDY: Or you can save money and disk space by doing the conversion with Jeff Lewis' Imagery. It converts BMP; EPS; GIF; JPEG; PCX; Photoshop; PICT; TIFF; and a bunch of other Mac, PC, UNIX, and Atari ST (A-a-i-i-e-e-e! Bad hardware flashback! I'm

tripping!) formats. Somehow Lewis padded the thing with converters for a pile of different animation- and sound-file formats and still fit it into only 217K of disk space. And he has the gall to release this as freeware? Lose no time in rushing to ZiffNet/Mac or any other on-line service and grab it quick before he regains his senses!

Old Versions: Save or Toss?

Q. When I upgrade a program, do I need to save the old versions or can I use them as coasters?

Brian K. Donnelly
Manchester, NH

BOB: I save them for a while just in case something goes wrong with the new version. I've had a new version corrupt files it's converting, for instance.

Only when you're positive the new version works as promised is it safe to use the old versions as coasters.

ANDY: Don't use them as coasters. The moisture from drinks tends to drop down onto the metal shutter and leave hard-to-remove rust stains on your fine furniture.

Besides, there are some advantages to using old software — it's often faster and uses less space on your disk. My Power-Book, for instance, is loaded up with downright ancient versions of Illustrator, Page-Maker, and Photoshop. Sure, they lack the advanced features of the up-to-date versions I've got running on my desktop Mac, but they're 100 percent file-compatible, take up about 40 MB less space, and run nice and fast on my puny 68000-based PowerBook 100.

figure 1 / **Everything a new programmer needs** in order to get started writing Mac software.

Programming Starter Kit

Q. What's the best way for me to get started writing software for the Mac (and please don't say HyperCard)? Which volumes of *Inside Macintosh* should I buy?

Mary Luebeck
Arlington, VA

ANDY: Seriously, using HyperCard wouldn't be a bad place to start. Perhaps a more useful introduction would be to try Apple-Script. It comes free with late-model Macs, and it lets you do some killer stuff right away.

The best development environments for beginners are THINK C and C++, from Symantec (see figure 1). Symantec's products are widely accepted, reliable, and easy to use. Don't be fooled by the popularity of the CodeWarrior system, from Metrowerks. It's been getting deep, passionate soul kisses from the developer community, but its pluses won't pay off for a new programmer.

As far as reference guides go, *Inside Macintosh* is useful but not until you have the basics down. *Learn C on the Macintosh* (Reading, MA: Addison-Wesley, 1991) and *Learn C++ on the Macintosh* (Reading, MA: Addison-Wesley, 1993), both by Dave Mark, are your best bet. The *Macintosh Programming Primer* series, also from Addison-Wesley, covers the specifics of programming on the Macintosh and also focuses on Symantec's THINK C and C++.

Finally, give some thought to learning LISP too. Most programmers are big fans, which means you can see echoes of it in most of the newer languages coming out, such as the forthcoming Dylan language and environment.

the program's data fork, which is where the PowerPC code is stored. Presto — you save hundreds of kilobytes in one easy step! [*Anonymity and DFerase are available on-line. See end of article. — Ed.*]

Jamie Ciocco
Cambridge, MA

BACKING UP SCATTERED FILES

You can use the Labels feature of System 7 if you often need to back up a specific set of files to another disk.

Open the Labels control panel, and change the name of one of your labels to Backup. Now highlight each file you want to back up, and choose the backup label from the Label menu in the Finder.

When you're ready to back up the files, press Command-F to bring up the Find dialog box and then click on More Choices and make the search criteria "label is Backup." Before you perform the find, select the disk where the files reside and check the All at Once box.

When you click on the Find button, the Finder will find and highlight all the backup

files simultaneously, even though some may be hidden. Then you can click on any one of them and drag it to the backup disk, and all the files will be copied to that disk.

Carl Silvestri
Coraopolis, PA

MacUser

1994 Product Index

We reviewed over 1,000 new products last year, so finding the review you want could be tough — if not for this handy index. Here you'll find issue dates and pages for every product we reviewed, conveniently grouped by category. **Compiled by Gregory Wasson**

◎ Available on CD-ROM; may also be available on floppy disks.

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You can find *MacUser's* 1994 Product Index in the MacUser and ZiffNet/Mac areas on CompuServe and eWorld. See page 4 for instructions regarding on-line access.

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Welcome to WIMP

THIS IS THE YEAR that Apple turns into a real PC company. The new PCI bus means that cheap PC peripherals can be added to the Mac. Of course, because their makers don't do anything more than design hardware, most of these cheap add-ons won't work without a lot of agony. Nobody told you that, did they?

Oh, and I suspect that Microsoft will manage to shoehorn Windows NT into the Mac too, where it will supplant the Mac OS. The long-predicted convergence of platforms is coming, and this is the weird form it appears to be taking: Apple Power Mac/PCI machines running Windows NT. And I see some cloners out there too. What a mess we have coming our way.

The Mac users are clueless about a lot of things, not the least of which is the world of Windows-Intel-Microsoft-PC, or the WIMP platform.

The WIMP platform has one interesting feature: It's power-hungry. The vendors who sell into this platform have developed more bloated, inefficient code than anyone could ever imagine. The software is so bad that tremendous hardware performance boosts over the past few years have been necessary to even get the crap to run. And it's still slow! Whenever it starts to speed up, Microsoft or someone else adds bags of sand to the code to slow it down even more.

No matter — Intel will save the day. Software will run three times as fast on a processor that runs three times as fast. More or less. But Intel is running out of gas, and its chip technology is in need of revamping, hence its deal to work with Hewlett-Packard on a new generation of processors. The only hot technology already out there that might save the day in the never-ending search for more and more power is the PowerPC (aptly named too!).

Although Intel will do its best to keep users off the PowerPC scent, that won't be enough. Users will still flock to PowerPC machines — especially if they're "kinda like PCs," with that PCI bus and all. In this case, *and all* means PC software. *PC software* means Windows. For the PowerPC machines, that means Windows NT. The WIMP platform is transposed! It turns from Windows-Intel-Microsoft-PC into Windows NT-IBM-Motorola-Power Mac. WIMPed again! Has anyone else noticed the recurrence of these four letters in this industry?

Sure, I hope the Mac OS dominates the PowerPC scene, but I think we should at least prepare for the worst. If the Power Mac turns into a Windows NT platform, expect the following to occur:

Pay More. Forget free or inexpensive updates and bug fixes. In the world of the PC, you pay for everything. You get into the platform cheap and spend the rest of your life paying for bug fixes. In fact, most PC-software companies consider updates major profit centers.

Plug-and-Pray. Once the Mac turns into a PC, the idea of plug-and-play — the Mac's real advantage in the marketplace — is dead. The WIMP environment is hopeless.

Although they talk a good game about a potential or future or someday-soon implementation of plug-and-play, forget it. They can't do it! It's impossible. This mess will creep over into the Mac world.

Conflicts Galore. Mac users have program and extension conflicts, sure. But few have a clue about what conflicts are all about until they enter the world of the WIMP machine. Doing the simplest system change such as adding a tape drive or a new SCSI device can cost a PC user a weekend. These lost weekends result in support lines going into overload on Monday morning.

Difference Influence. The worst aspect to all this is that once you've entered the PC world, the major intellectual influences

change from Claris and Adobe and Global Village to Microsoft and Lotus and Novell. The orientation is much less creative, much more bottom-line money, money, money. Creepier, actually.

Of course, anything is possible, and none of this may happen if Apple gets its act together. It has designed a new logo, and I hope that's an indication of some important changes in the company and its attitude toward the market and Microsoft in particular. Keeping in tight with IBM is a good sign, because Apple finally recognizes that Microsoft, not IBM, is its real enemy.

By the end of 1995, the smoke obscuring the future of computing will clear. When it does, let's hope we see the new Apple OS happy face and not Windows NT as the startup logo on our machines.